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E R R A T U M

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AVIATION TRAINING AND READINESS MANUAL, VOLUME 6
UNMANNED AERIAL VEHICLE
(SHORT TITLE: T&R MANUAL VOLUME 6)

1. For administrative purposes, the Publications Control Number (PCN) has been reidentified. Change the PCN "10203352100" to read: "10203351200".

Headquarters, U.S.
Marine Corps

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AVIATION TRAINING AND READINESS MANUAL, VOLUME 6, UNMANNED AERIAL VEHICLE (SHORT TITLE: T&R MANUAL, VOLUME 6)

DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-0001

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MARINE CORPS ORDER P3500.21A

From: Commandant of the Marine Corps
To: Distribution List

Subj: AVIATION TRAINING AND READINESS MANUAL, VOLUME 6, UNMANNED AERIAL VEHICLE (SHORT TITLE: T&R MANUAL, VOLUME 6)

Encl: (1) Locator Sheet

1. Purpose. To revise training standards, procedures and policies regarding the training of unmanned aerial vehicle aircrews.

2. Cancellation. MCO P3500.21.

3. Summary of Revision. This Manual was substantially changed to facilitate a standardized approach to training and incorporate the tenets of the Marine Corps Aviation Campaign Plan.

a. The Internal Pilot and Payload Operator syllabi were consolidated into Chapter 1, Internal Operator. The Mission Commander syllabus was broken out of the old Internal Pilot syllabus and is now Chapter 3. The External Pilot syllabus remains as Chapter 2 and was renamed External Operator.

b. Notional training progression models were developed for each crew position to graphically depict training in relation to time.

c. Each syllabus is composed of ground, simulator and flight events. Each event is assigned a Combat Readiness Percentage.

d. Appendix A is new and depicts the VMU squadron core competency model.

e. Appendix B depicts the unit training template showing requirements for skill qualifications and designations.

f. Each syllabus contains a crew member "Qualified in Model" certification requirement.

4. Reserve Applicability. This Manual is not applicable to the Marine Corps Reserve.

5. Certification. Reviewed and approved this date.

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//signature//
T. S. JONES
By direction

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ENCLOSURE (1)

RECORD OF CHANGES

Log completed change action as indicated

Change Number	Date of Change	Date Entered	Signature of Person Incorporated Change

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CHAPTER 1

UNMANNED AERIAL VEHICLES (UAV) INTERNAL OPERATOR (7314)

FIGURES

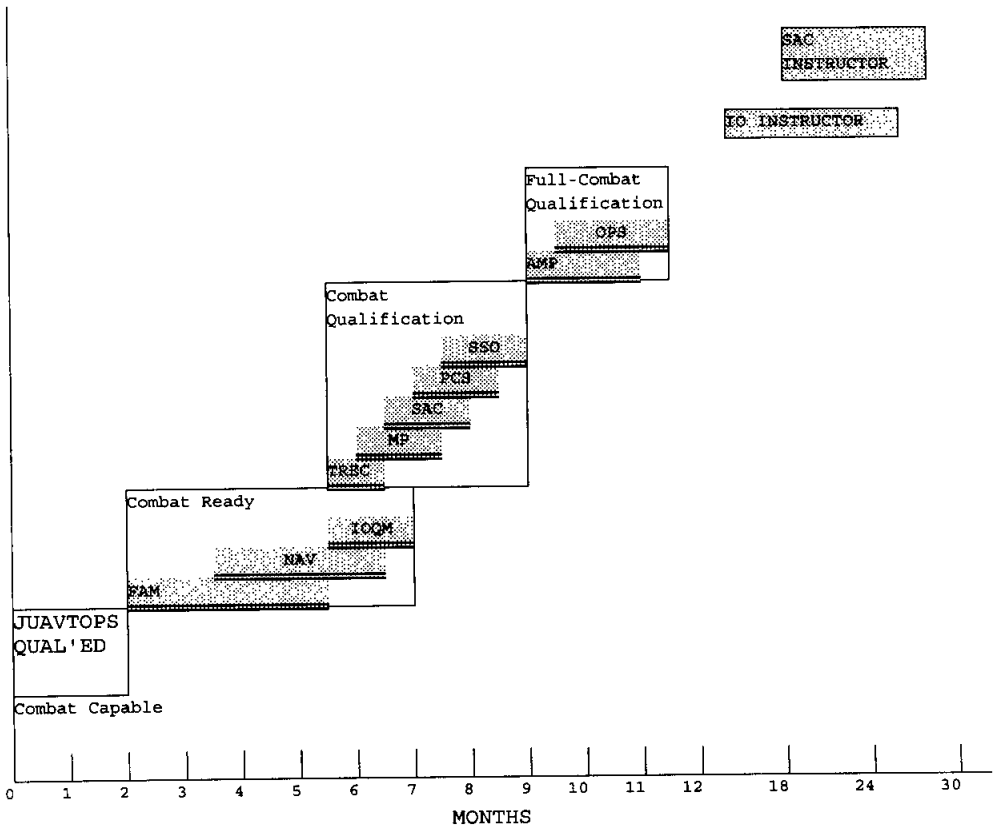

Figure 1-1.--Internal Operator Notional Training Progression Model

100. PROGRAM OF THE INSTRUCTION (POI) FOR BASIC INTERNAL OPERATOR

WEEKS	COURSE	ACTIVITY
1-8	Combat Capable	NAMTRAGRU DET AMTU 6001
9-21	Combat Ready	Tactical Squadron
22-40	Combat Qualification	Tactical Squadron
41-52	Full-Combat Qualification	Tactical Squadron

101. POI FOR CONVERSION INTERNAL OPERATOR

WEEKS	COURSE	ACTIVITY
*	Combat Capable	NAMTRAGRU DET AMTU 6001
1-12	Combat Ready	Tactical Squadron
13-31	Combat Qualification	Tactical Squadron
32-43	Full-Combat Qualification	Tactical Squadron

*Combat Capable Refresher POI under development by NAMTRAGRU DET

102. POI FOR REFRESHER INTERNAL OPERATOR

WEEKS	COURSE	ACTIVITY
*	Combat Capable	NAMTRAGRU DET AMTU 6001
1-8	Combat Ready	Tactical Squadron
9-27	Combat Qualification	Tactical Squadron
28-34	Full-Combat Qualification	Tactical Squadron

*Combat Capable Refresher POI under development by NAMTRAGRU DET

110. GROUND/ACADEMIC TRAINING COURSES OF INSTRUCTION

Course	Activity
Internal Operator Course	NAMTRAGRU DET AMTU 6001
IO Ground/Flight Syllabus	Tactical Squadron
Medical Requirements	See OPNAVINST 3710.7__

111. SQUADRON LEVEL TRAINING

Publications and Related Directives
Communications Procedures
Maintenance Procedures
Safety
Weapons Training
MAWTS-1 Academic Support Package
Map Interpretation
Search and Rescue
Fueling and Servicing
Aircraft Recognition
Troubleshooting (Ground/In-flight)

120. PROGRAM OF INSTRUCTION FOR BASIC INTERNAL OPERATOR

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft. Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 141.

2. Combat Ready Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT	CRP PERCENT
Familiarization	2/0/6	2.0/0.0/7.0	6.6
Navigation	1/0/4	2.0/0.0/4.0	4.4
Automated Navigation	0/0/2	0.0/0.0/2.0	2.0
Internal Operator Qualified in Model	0/0/2	0.0/0.0/4.0	2.0
Totals for phase	**3/0/14**	**4.0/0.0/17.0**	**15.0**
Combined Totals	**17**	**21.0**	**15.0**
Accumulation for Basic POI	**17**	**21.0**	**75.0**

3. Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT	CRP PERCENT
Threat Recognition	2/0/0	2.0/0.0/0.0	1.0
Mission Planning	1/0/2	1.0/0.0/4.0	5.0
Supporting Arms Control	1/1/1	3.5/1.0/2.0	4.0
Portable Control Station	1/0/2	1.0/0.0/2.0	5.0
Split Site Operations	1/0/2	1.0/0.0/2.0	5.0
Totals for phase	**6/1/7**	**8.5/1.0/10.0**	**20.0**
Combined totals	**14**	**19.5**	**20.0**
Accumulation for Basic POI	**31**	**40.5**	**95.0**

4. Full-Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT	CRP PERCENT
Advanced Mission Planning	1/0/1	1.0/0.0/2.0	2.5
Dual Operations	1/0/1	1.0/0.0/1.0	2.5
Totals for phase	**2/0/2**	**2.0/0.0/3.0**	**5.0**
Combined totals	**4**	**5.0**	**5.0**
Totals for Basic POI	**35**	**45.5**	**100.0**

121. PROGRAM OF INSTRUCTION FOR CONVERSION INTERNAL OPERATOR

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft. Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 141.

2. Combat Ready Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Familiarization	2/0/6	2.0/0.0/7.0
Navigation	1/0/2	2.0/0.0/2.0
Automated Navigation	0/0/2	0.0/0.0/2.0
Internal Operator Qualified in Model	0/0/2	0.0/0.0/4.0
Totals for phase	**3/0/12**	**4.0/0.0/15.0**
Combined totals	**15**	**19.0**
Accumulation for Conversion POI	**15**	**19.0**

3. Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Threat Recognition	2/0/0	2.0/0.0/0.0
Mission Planning	1/0/1	1.0/0.0/2.0
Supporting Arms Control	1/0/1	3.5/0.0/2.0
Portable Control Station	1/0/2	1.0/0.0/2.0
Split Site Operations	1/0/2	1.0/0.0/2.0
Totals for phase	**6/0/6**	**8.5/0.0/8.0**
Combined totals	**12**	**16.5**
Accumulation for Conversion POI	**27**	**35.5**

4. Full-Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Advanced Mission Planning	1/0/1	1.0/0.0/2.0
Dual Operations	1/0/1	1.0/0.0/1.0
Totals for phase	**2/0/2**	**2.0/0.0/3.0**
Combined totals	**4**	**5.0**
Totals for Conversion POI	**31**	**40.5**

122. PROGRAM OF INSTRUCTION FOR REFRESHER INTERNAL OPERATOR

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft. Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 141.

2. Combat Ready Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Familiarization	2/0/2	2.0/0.0/3.0
Navigation	1/0/2	2.0/0.0/2.0
Automated Navigation	0/0/1	0.0/0.0/1.0
Internal Operator Qualified in Model	0/0/2	0.0/0.0/4.0
Totals for phase	**3/0/7**	**4.0/0.0/10.0**
Combined totals	**10**	**14.0**
Accumulation for Refresher POI	**10**	**14.0**

3. Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Threat Recognition	2/0/0	2.0/0.0/0.0
Mission Planning	1/0/1	1.0/0.0/2.0
Supporting Arms Control	1/0/1	3.5/0.0/2.0
Portable Control Station	1/0/2	1.0/0.0/2.0
Split Site Operations	1/0/2	1.0/0.0/2.0
Totals for phase	**6/0/6**	**8.5/0.0/8.0**
Combined totals	**12**	**16.5**
Accumulation for Refresher POI	**22**	**30.5**

4. Full-Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Advanced Mission Planning	0/0/1	0.0/0.0/2.0
Dual Operations	0/0/1	0.0/0.0/1.0
Totals for phase	**0/0/2**	**0.0/0.0/3.0**
Combined totals	**2**	**3.0**
Totals for Refresher POI	**24**	**33.5**

123. PROGRAM OF INSTRUCTION FOR INSTRUCTOR TRAINING

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Instructior Under Training	4/1/4	6.5/1.0/7.0
Total for IUT	**9**	**14.5**

124. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
RQD	0/0/2	0.0/0.0/4.0
Ship Board Operations	1/0/2	1.0/0.0/2.0
Total for RQD	**5**	**7.0**

140. FLIGHT/SIMULATOR PERFORMANCE REQUIREMENTS

1. General

a. This manual generalizes mission guidance to allow for local conditions and to allow this manual to remain unclassified. CMC (A) and CG MCCDC encourage squadrons to use the full range of tactics in the tactical manuals and adopt the latest developed and proven tactics.

b. Compliance with written flight description is mandatory for syllabus flight completion. Events are listed as: FLT = Aircraft only, SIM = simulator only, GRD = Ground Event, FLT/SIM = Aircraft preferred/Simulator optional, or SIM/FLT = Simulator preferred/Aircraft optional. In the absence of a flight simulator, completion of a simulator syllabus event is not required to complete that stage. Completion of those events should be accomplished as soon as practicable upon simulator availability. Should the command desire, simulator events can be flown as actual flight events for T&R credit. ACT will be stressed and evaluated throughout each stage.

c. All events shall terminate with a comprehensive debrief with emphasis on the aircrew's performance using all evaluation techniques.

d. Internal Operators shall fly events annotated with an "N" at least 30 minutes after official sunset. Events annotated with "(N)" may be conducted either in the day or night.

2. Syllabus Assignment

a. Basic internal operators will be assigned to fly the entire syllabus. Conversions and Refreshers will fly the flights designated by a "C" or "R" respectively in the flight description.

b. Refresher Syllabus. The refresher syllabus is predicated on the experience of the refresher Internal Operator. An Internal Operator in the refresher syllabus should fly all "R" coded events. **However, a refresher Internal Operator need not fly every event within a stage of training to be requalified in that stage. The Commanding Officer may tailor the refresher syllabus to fit the experience of the refresher Internal Operator per MCO P3500.14F.** When the "R" coded events within a stage of training are complete, the Internal Operator may be credited with the CRP from the entire stage of training. This assumes that the refresher has had previous proficiency in that stage of training. If the refresher Internal Operator has no previous proficiency in a stage or particular event, then the refresher should fly the entire stage or all events not previously flown. The refresher syllabi applies only up to the stage achieved during the prior tour, after that the Internal Operator will complete the entire remaining syllabus.

3. Aircrew Evaluation Flights. All internal operators shall have a JUAVTOPS evaluation form filled out annually upon completion of the annual JUAVTOPS Check (RQD-600). A designated JUAVTOPS instructor or an assistant JUAVTOPS instructor shall evaluate RQD-600.

4. Aircrew Training Forms (ATFs)

a. An ATF is required for any initial event completed by a Basic, Transition, Conversion, or Refresher Internal Operator or as recommended by the Squadron Standardization Board.

b. If the Commanding Officer has waived a syllabus event, the squadron training officer shall place a waiver letter in section 3 of the APR.

5. Instructor Requirements. The minimum instructor requirements are listed in each phase of training.

6. Flight Completion. Compliance with the written flight description is mandatory for syllabus flight completion. Times indicated for each flight are only recommendations.

7. Weight and Balance. Weight and balance sheets will be completed per JUAVTOPS guidelines and Standard Operating Procedures.

8. Crew Requirements/Position Designations. Crew requirements are listed for each event. Crew positions are listed for each event at the right margin of the event header.

9. Previous Qualification. Refresher internal operators previously qualified in any syllabus stage should fly only those "R" coded flights. If not previously qualified, they shall fly the full basic syllabus for those stages.

10. Sequence. Training should be accomplished by flying events within a stage in sequence and stages in sequence when practical.

11. Definitions

a. Discuss

(1) The Internal Operator Instructor (IOI) shall discuss a procedure or maneuver during the brief, in flight, or debrief.

(2) The Internal Operator Under Instruction (IOUI) is responsible for knowledge of the applicable procedures prior to the briefing.

b. Demonstrate

(1) The IOI performs the maneuver with accompanying description.

(2) The IOUI observes the maneuver and is responsible for the knowledge of the procedures prior to the flight.

c. Introduce

(1) At his option, the IOI may perform the maneuver with an accompanying description, or he may coach the IOUI through the maneuver without demonstration.

(2) The IOUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight.

d. Review

(1) The IOI observes and grades the maneuver without coaching the IOUI. An airborne critique of the IOUI's performance is at the option of the instructor.

(2) The IOUI is expected to perform the maneuver without coaching and devoid of procedural error at a level acceptable to warrant progress into the next stage of training.

141. COMBAT CAPABLE PHASE

1. General

a. Combat Capable Instruction consists of military and contractor training conducted at the designated training unit. Syllabus description and requirements are available in the current edition of the training unit's syllabus. Upon completion of Combat Capable Phase, the IO is considered a JUAVTOPS qualified as an Internal Operator.

b. Basic System Familiarization. Basic system/IO familiarization and qualification will be obtained during the Combat Capable Phase of Training at the designated training unit. The following stages make up the basic system familiarization and qualification portion of the Combat Capable Training (based on the established Training Unit Class outline): Introduction to the Pioneer UAV system, GCS, PCS, TCU, RRS, equipment familiarization, system operating modes, payloads, autopilot, UAV system operating procedures, mission planning, map reading, aerial navigation, emergency procedures, UAV launch/recovery systems and JUAVTOPS qualification.

c. Omitted Sorties. Flight training events which are not flown in the Combat Capable Training shall be flown in the succeeding stage of training.

d. Evaluation Sorties. Designated evaluation sorties should be flown with a qualified IO instructor or experienced Mission Commander.

2. Syllabus Assignments. The IO should fly the entire Combat Capable Phase before advancing to the next phase.

3. Re-fly Intervals. Listed in the training unit's syllabus.

4. Combat Capable Syllabus Objectives. Listed below are the titles of the learning objective areas associated with the entry level training syllabus for Pioneer UAV Internal Operators. This course of instruction is conducted by NAMTRAGRU DET AMTU 6001, Fort Huachuca, Arizona. Detailed descriptions of each area available from NAMTRAGRU DET AMTU 6001.

1) Basic Aerodynamics
2) Basic Navigation
3) FAA Regulation/Procedures
4) Ground/Flight Safety and Mishap Procedures/Reporting
5) Aircrew Coordination
6) SOP and Course Rules
7) JUAVTOPS Checklist Procedures
8) JUAVTOPS and Aircrew Training Records
9) Weather and Factors on UAV Operations
10) Basic Mission Planning
11) Technical/Maintenance Documentation
12) Emergency Procedures
13) Pioneer UAV
14) Ground Control Station
15) Tracking Communications Unit
16) Portable Control Station
17) Remote Receive Station
18) System Limitations
19) Day Payload
20) Night Payload
21) Briefing/Debriefing
22) Modes of Launch/Recovery
23) Flight Modes
24) In-Flight Navigation
25) Aircrew Training Documentation
26) Fire Support
27) Radio Communication Procedures
28) Advanced Mission Planning
29) Performance Flights
30) JUAVTOPS Check Ride

142. COMBAT READY PHASE

1. Purpose. To develop Internal Operator combat proficiency and certify the IO as Qualified-in-Model.

2. General

a. The Individual Under Training should be Combat Capable Phase of Training complete prior to commencing Combat Ready Training.

b. Ground Training. Ground (GND) syllabus events have been scheduled to augment the flight syllabus requirements. These events can be executed in conjunction with the flight events. However, the completion of the ground training event prior to its corresponding flight is mandatory. Ground events can not update or replace the corresponding flight event.

3. Familiarization (FAM)

a. Purpose. To develop proficiency and experience in tactical UAV system operation and to emphasize the importance of crew coordination, system operation, emergency procedures, operational terminology and familiarization with local SOPs.

b. General

(1) Prior to commencement of this stage of training, the operator will successfully complete the local course rules exam and Squadron Flight SOP exam.

(2) To be trained in this portion of the academic and flight syllabus all operators will have at a minimum an interim secret clearance.

c. Ground Training. (2 events, 2.0 hours).

d. Flight Training. (6 Flights, 7.0 hours).

FAM-200 1.0 GND C,R CREW POSITION: IO

Goal. Introduce the operator to the area of operation, unit SOPs, local course rules and regulations.

Requirement. The Internal Operator will successfully complete the annual course rules exam and the squadron SOP exam.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

FAM-201 1.0 GND C,R RQ-2 CREW POSITION: IO

Goal. Introduce the operator to the unit's system, crew coordination and pre-flight/presets.

Requirement. Review/discuss all components of the unit's system, crew coordination, presets for the OBY, TBY, and PBY, pre-flight of all system components individual crew position responsibilities, RATO/Pnuematic launch procedures and post flight procedures.

Performance Standards. During a practical application, correctly perform IAW JUAVTOPS and local SOPs, all presets, pre and post flight procedures.

FAM-202 1.0 FLT C GCS (N) CREW POSITION: PO

Goal. Introduce local flight procedures.

Requirement. The operator will be introduced to the local pattern procedures while occupying the PO position. The operator will be required to position the payload for landing and launch, and identify entry/exit points.

Performance Standards. IAW JUAVTOPS.

Prerequisites. FAM-200, FAM-201.

FAM-203 1.0 FLT C GCS (N) CREW POSITION: IP

Goal. Introduce local flight procedures.

Requirement. The operator will be introduced to the local pattern and emergency procedures while occupying the IP position. The operator will be required to complete a landing and launch, and identify entry/exit points.

Performance Standards. IAW JUAVTOPS.

Prerequisites. FAM 200, FAM 201.

FAM-204 1.0 FLT C GCS (N) CREW POSITION: PO

Goal. Introduce payload operation during a range flight.

Requirement. The operator will be introduced to range flight operations while occupying the PO position. The operator will operate the payload in rate, position, camera guide and target acquisition control modes. Introduce emergency procedures.

Performance Standards. IAW JUAVTOPS.

Prerequisites. FAM-202.

FAM-205 1.0 FLT C RQ-2 (N) CREW POSITION: IP

Goal. Conduct local flight area procedures.

Requirement. The operator will conduct local pattern procedures to include entry/exit procedures while occupying the IP position. Introduce dish lock procedures, range flight operations, flight control in sticks, knobs, combination, and camera guide. Review emergency procedures.

Performance Standards. IAW JUAVTOPS.

Prerequisite. FAM-203.

FAM-206 1.0 FLT C,R RQ-2 (N) CREW POSITION: PO

Goal. Conduct payload operation during a range flight.

Requirement. The operator will conduct payload operation during a range flight while occupying the PO position. The operator will operate the payload in rate, position, camera guide and target acquisition control modes. Review and conduct emergency procedures.

Performance Standards. IAW JUAVTOPS.

Prerequisite. FAM-204

FAM-207 2.0 FLT C,R RQ-2 (N) CREW POSITION: IP

Goal. Conduct range flight operations.

Requirement. The operator will conduct range flight procedures while occupying the IP position. Review and conduct emergency procedures.

Performance Standards. IAW JUAVTOPS the operator must successfully complete two dish locks, flight control in sticks, knobs, combination and camera guide.

Prerequisite. FAM-205.

4. Navigation (NAV)

a. Purpose. To develop proficiency and experience in UAV navigational procedures.

b. General. Combat Capable Training must be obtained prior to commencing this stage.

c. Ground Training. (1 Event, 2.0 hours).

d. Flight Training. (4 Flights, 4.0 hours).

NAV-210 2.0 GND C,R CREW POSITION: IO

Goal. Introduce the operator to UAV navigation.

Requirement. Discuss the principles of map reading, terrain association, UAV navigation instruments, plotter operation, use of radial maps, the navigation programmer mode, and radar or ATC advisements.

Prerequisite. FAM-201.

NAV-211 1.0 FLT GCS CREW POSITION: PO

Goal. Introduce the payload operator to UAV navigation.

Requirement. Introduce the operator to navigation using the plotter, radial maps, terrain association, payload graphics, and plotter failure procedures.

Performance Standards

(1) Using the plotter, locate and identify two points.

(2) Using terrain association, locate and identify two points.

(3) Using radial maps, locate and identify two points.

(4) Using payload graphics, locate and identify two points.

(5) During plotter failure, perform effective crew coordination to navigate.

Prerequisites. FAM-206, NAV-210.

NAV-212 1.0 FLT C,R GCS N CREW POSITION: PO

Goal. Introduce the payload operator to night UAV navigation.

Requirement. Introduce the operator to navigation at night using the plotter, radial maps, terrain association, payload graphics, and plotter failure procedures.

Performance Standards

(1) Using the plotter, locate and identify two points.

(2) Using terrain association, locate and identify two points.

(3) Using radial maps, locate and identify two points.

(4) Using payload graphics, locate and identify two points.

(5) During plotter failure, perform effective crew coordination to navigate.

Prerequisite. FAM-206, NAV-210.

NAV-213 1.0 FLT GCS CREW POSITION: IP

Goal. Introduce the operator to UAV navigation.

Requirement. Introduce the operator to navigation using the plotter, radial maps, plotter failure procedures and radar or ATC advisement.

Performance Standards. During the knob control mode of flight:

(1) Using the plotter, navigate to two points.

(2) Using radial maps, navigate to two points.

(3) During plotter failure, perform effective crew coordination to navigate.

Prerequisites. FAM-207, NAV-210.

NAV-214 1.0 FLT C,R GCS (N) CREW POSITION: IP

Goal. Conduct UAV navigation using knob and stick control modes.

Requirement. The operator will conduct navigation during knob and stick control. The operator will navigate using the plotter, radial maps, and plotter failure procedures.

Performance Standards. During the knob and stick control modes of flight:

(1) Using the plotter, navigate to two points.

(2) Using radial maps, navigate to two points.

(3) During plotter failure, perform effective crew coordination to navigate.

Prerequisite. NAV-213.

5. Automated Navigation (NAV)

a. Purpose. To develop proficiency and experience in using the Navigation Programmer control mode.

b. Flight Events. (2 Flights, 2.0 hours).

NAV-220 1.0 FLT C GCS (N) CREW POSITION: IP

Goal. Review the Navigation Programmer Mode.

Requirement. Review navigation programmer mode. Discuss trouble shooting techniques during flight and emergency procedures.

Performance Standards. The operator will input data for four points and fly in Dead Reckoning, GCS and GPS operational modes.

Prerequisite. NAV-214.

NAV-221 1.0 FLT C,R GCS (N) CREW POSITION: IP

Goal. Conduct a flight Navigation Programmer Mode.

Requirement. Conduct a flight in navigation programmer mode.

Performance Standards. The operator will successfully load data and execute navigation programmer to fly to four specific points. Explain trouble shooting procedures during simulated flight problems. Explain emergency procedures IAW JUAVTOPS during simulated emergencies.

Prerequisite. NAV-220.

6. Internal Operator Qualification in Model (IOQM)

a. Purpose. To certify the Internal Operator Under Instruction as an Internal Operator Qualified in Model (IOQM).

b. General. At the completion of this IOQM-231 the operator is considered Internal Operator Qualified in Model and may be designated as IOQM by the commanding officer.

c. Prerequisite. Combat Ready Phase complete prior to these flights.

d. Flight Training. (2 Flights, 4.0 hours).

IOQM-230 2.0 FLT C,R,E GCS (N) CREW POSITION: PO

Goal. Certify the IOUI in the PO position.

Requirement. During a local and range flight, the IOUI will be evaluated while occupying the PO position on all PO procedures covered in the Combat Ready Phase.

Performance Standards. Execute PO procedures in rate, position, camera guide, and target acquisition modes. Execute emergency procedures IAW JUAVTOPS during simulated emergencies. Perform effective crew coordination during normal operations and simulated emergencies. The PO must successfully complete a launch and recovery, three simulated emergencies and locate and identify a minimum of four specific points.

IOQM-231 2.0 FLT C,R,E GCS (N) CREW POSITION: IP

Goal. Certify the IOUI in the IP position.

Requirement. During a local and range flight, the IOUI will be evaluated while occupying the IP position on all IP procedures covered in the combat ready phase.

Performance Standards. Execute IP procedures in all control modes and all methods of navigation. Execute emergency procedures IAW JUAVTOPS during simulated emergencies. Perform effective crew coordination during normal operations and simulated emergencies. The IP must successfully complete a launch and recovery, five simulated emergencies and navigate to a minimum of four specific points.

143. COMBAT QUALIFICATION PHASE

1. Purpose. To develop proficiency of the Internal Operator in the tactical employment of the UAV system.

2. Threat Recognition (TREC)

a. Purpose. To develop proficiency and experience in threat recognition.

b. Ground Training. (2 Events, 2.0 hours).

TREC-300 1.0 GND C,R CREW POSITION: IO

Goal. Evaluate threat weapons and vehicle recognition.

Requirement. The IO will attend a weapons vehicle recognition class given by the intelligence section. The class will include friendly as well as enemy weapon/vehicle recognition.

Performance Standards. Upon completion of this event, the IO will pass an exam with a minimum score of 80%.

TREC-301 1.0 GND C,R CREW POSITION: IO

Goal. Evaluate threat SAM/AAA recognition.

Requirement. The IO will attend a SAM/AAA recognition class given by the intelligence section. The class will include friendly as well as enemy SAM/AAA.

Performance Standards. Upon completion of this event, the IO will pass an exam with a minimum score of 80%.

3. Mission Planning (MP)

a. Purpose. To develop proficiency and experience in tactical UAV mission planning.

b. Ground Training. (1 Event, 1.0 hour).

c. Flight Training. (2 Flights, 4.0 hours).

MP-310 1.0 GND C,R CREW POSITION: IO

Goal. Introduce mission planning.

Requirement. The operator will be introduced to the mission planning cycle.

Performance Standards. The operator will learn how to collect meteorological data, calculate fuel required, take off distance, routes, altitude requirements, airspeeds and coordinate with the intelligence and operations sections for mission requirements.

MP-311 2.0 FLT GCS (N) CREW POSITION: IO

Goal. Introduce mission planning.

Requirement. The operator will execute a planned mission to include the conduct of all pre-flight planning and the preparation of the tactical mission brief. During the course of the mission, airborne mission changes will be introduced.

Performance Standards. Operator will conduct the mission as planned in order to locate four specific targets/areas.

Prerequisite. MP-310 and FAM-206 or FAM-207.

MP-312 2.0 FLT C,R GCS (N) CREW POSITION: IO

Goal. Conduct mission planning.

Requirement. The operator will be given a tactical scenario and mission requirements. Using this, the operator will work with the entire flight crew in order to plan an entire mission and proceed with the mission as planned. During the flight phase the operator will be required to demonstrate airborne mission changes.

Performance Standards. The operator must plan and brief the mission IAW briefed scenario parameters and locate and report items to meet mission and scenario requirements.

Prerequisite. MP-311.

4. Supporting Arms Controller (SAC)

a. Purpose. To develop proficiency and experience in UAV supporting arms control.

b. Ground Training. (1 Event, 3.5 hours).

c. Simulator Training. (1 Simulator Event, 1.0 hours). For this portion of training the operator may use the TSFO Facility or CAS Trainer Facility to simulate the control of supporting arms. As much realism as possible is encouraged. This event can not update any flight events.

d. Flight Training. (1 Flight, 2.0 hours)

SAC-320 3.5 GND C,R CREW POSITION: IO

Goal. Introduce the operator to supporting arms control.

Requirement. The operator will receive a period of instruction on the call for fire for artillery, mortar and naval surface fires, supporting arms adjustment using the light pen and other methods. The operator will also receive instruction on communications to fire support units, and weapon systems in artillery, mortars and naval surface fires.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80 percent.

SAC-321 1.0 SIM/FLT C,R CREW POSITION: IO

Goal. Introduce the call for fire and adjustment of supporting arms.

Requirement. Using the TSFO Trainer, CAS Trainer Facility, or actual flight the operator will conduct simulated missions to build knowledge and experience in fire adjustment.

Performance Standards. The operator must correctly call for and adjust a minimum of three artillery/mortar/naval surface fires missions.

Prerequisite. SAC-320.

SAC-322 2.0 FLT C,R GCS (N) CREW POSITION: PO

Goal. Conduct call for fire and adjustment of supporting arms utilizing the light pen.

Requirement. The operator will successfully provide adjustment of fire support to have effect on a specific target.

Performance Standards. Complete a minimum of three artillery/ mortar/naval surface fires missions. The operator will also report BDA upon completion of firing.

Prerequisite. SAC-321.

Ordnance

(1) Eight 155mm HE

(2) Five 155mm WP

(3) Equivalent mortar/NSF ammunition may be substituted for the above.

External Syllabus Support. (1) 155mm Battery, (1) 81mm/60mm mortar section, (1) NSF support ship.

5. Portable Control Station Flight (PCS)

a. Purpose. To develop proficiency and experience in operating from the Portable Control Station and UAV split site operations.

b. General. The operator must complete the Combat Ready Training prior to executing these events.

c. Ground Training. (1 event, 1.0 hour).

d. Flight Training. (2 Flights, 2.0 hours).

PCS-330 1.0 GND C,R PCS CREW POSITION: IO

Goal. Introduce the operator to flight operations from the PCS.

Requirement. Discuss the differences in payload operation, navigation from the GCS to the PCS on a range flight. Review appropriate preset menus and payload control. This training should be based on future split site or dual UAV operations.

Prerequisite. IOQM designated.

PCS-331 1.0 FLT C,R PCS (N) CREW POSITION: PO

Goal. Conduct payload operation from the PCS.

Requirement. Review/discuss/demonstrate/conduct payload operation from the PCS.

Performance Standards. Locate and identify at a minimum of one check point IAW JUAVTOPS.

Prerequisite. PCS-330.

PCS-332 1.0 FLT C,R PCS (N) CREW POSITION: IP

Goal. Conduct flight operation from the PCS.

Requirement. Review/discuss/demonstrate/conduct range flight operations from the PCS.

Performance Standards. Navigate to a minimum of one check point IAW JUAVTOPS.

Prerequisite. PCS-330.

6. Split Site Operations (SSO)

a. Purpose. To develop proficiency and experience in operating the UAV during split site operations.

b. General. The operator must complete the Combat Ready Training prior to executing these events.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (2 Flights, 2.0 hours).

SSO-340 1.0 GND C,R CREW POSITION: IO

Goal. Introduce Split Site Operations.

Requirements. The operator will be introduced to UAV split site operations and procedures. Discuss emergency procedures, return home procedures, mission planning requirements, communication procedures, presets/pre-flight checks and control transfer with and without voice communications.

Prerequisite. IOQM designated.

SSO-341 1.0 FLT C,R PCS (N) CREW POSITION: IP

Goal. Conduct Split Site operations from the PCS.

Requirement. The operator will successfully transfer control between stations with and without voice communications. Discuss return home and emergency procedures during split site operations.

Performance Standards. Transfer control IAW JUAVTOPS.

Prerequisites. PCS-332, SSO-340.

SSO-342 1.0 FLT C,R GCS (N) CREW POSITION: IP

Goal. Conduct Split Site operations from the GCS.

Requirements. The operator will successfully transfer control with and without voice communications. Discuss return home procedures and emergency procedures during split site operations.

Prerequisites. SSO-340.

144. FULL-COMBAT QUALIFICATION PHASE

1. Advanced Mission Planning (AMP)

a. Purpose. To introduce, develop proficiency and experience in advanced mission planning.

b. General. The operator must have completed Combat Ready Qualification Training prior to executing these events.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (1 Flight, 2.0 hours).

AMP-400 1.0 GND C CREW POSITION: IO

Goal. Introduce advanced mission planning.

Requirement. Introduce selection of UAV deployment site for single and split site operations. Determine mission requirements from JTAR/S, ACOs and ATOs. Determine coordination, communication, and planning requirements needed to effectively integrate with other aircraft and supporting arms.

Performance Standard. IAW JAUVTOPS, and considering the following parameters: communications, intelligence, fire support coordination, aviation schemes of maneuver, ground schemes of maneuver, airspace control measures, aviation tasking, command and control, and joint/combined forces determine planning and execution requirements for UAV operations.
Prerequisite. MP-312.

AMP-401 2.0 FLT C,R RQ-2 (N) CREW POSITION: IO

Goal. Conduct advanced mission planning.

Requirement. The operator will conduct a complete mission brief of the mission planned in AMP-400. After executing the mission, conduct mission debrief.

Performance Standards. Successfully execute tactical mission as planned.

Prerequisite. AMP-400.

2. Dual UAV Operations (OPS)

a. Purpose. To introduce and develop proficiency and experience in dual UAV operations. Dual UAV operations is defined as having two UAVs airborne at once and conducting a relief on station in order to increase mission time and time on station.

b. General. The operator must complete the Combat Qualification syllabus.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (1 Flight, 1.0 hour).

OPS-410 1.0 GND C,R CREW POSITION: IO

Goal. Introduce dual UAV operations.
Requirement. The Internal Operator will be introduced to dual UAV operations. Discuss procedures for transferring control of UAVs, checklist, frequency requirements, specific emergency procedures, and crew coordination. Review NAV Programmer Control mode.

OPS-411 1.0 FLT C,R RQ-2 (N) CREW POSITION: IP

Goal. Conduct dual UAV flight operations.

Requirement. The operator will conduct dual UAV flight operations while occupying the IP position from either the PCS or GCS. Review JUAVTOPS and/or Squadron SOPs, NAV Programmer Control and emergency procedures unique to dual UAV operations.

Performance Standards. IAW JUAVTOPS and local SOPs.

Prerequisite. OPS-410.

150. INSTRUCTOR UNDER TRAINING (IUT)

1. INTERNAL OPERATOR INSTRUCTOR UNDER TRAINING

a. Purpose. To develop proficiency and experience as an Internal Operator Instructor. Upon completion, the operator will be considered qualified to be designated as an UAV Internal Operator Instructor.

b. General. Combat Qualification Training should be obtained prior to commencing instructor training. The Commanding Officer may waiver training requirements.

c. Ground Training. (3 Events, 3.0 hours).

d. Flight Training. (4 Flights, 7.0 hours).

IUT-500 1.0 GND C,R,E CREW POSITION: IUT

Goal. Introduce the IUT to the principles of instruction.

Requirement. Discuss references for training such as JUAVTOPS, T&R Manual, Local SOPs and Unit SOPs. Introduce T&R requirements and training documentation. The IUT will fully understand all system components and their functions.

IUT-501 1.0 GND C,R,E RQ-2 CREW POSITION: IUT

Goal. Conduct a FAM-201 instruction.

Requirement. The IUT will conduct FAM-201.

IUT-502 2.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Conduct instruction during a FAM flight event.

Requirement. The IUT must demonstrate the ability to instruct an internal pilot and payload operator during a FAM flight.

Performance Standards. Identify and evaluate performance and correct deficiencies in a timely manner.

IUT-503 2.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Conduct instruction during a NAV flight.

Requirement. The IUT must demonstrate the ability to instruct an Internal Pilot and Payload Operator during a NAV flight.

Performance Standards. Be able to evaluate performance and correct deficiencies. Demonstrate navigation using plotter, without plotter, payload graphics, radial maps and system information.

IUT-504 1.0 GND C,R,E CREW POSITION: IUT

Goal. Demonstrate MP-310 instruction.

Requirement. The IUT will conduct a MP-310 training class.

IUT-505 2.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Demonstrate instruction for a MP-312 flight.

Requirement. The IUT will demonstrate the ability to instruct an Internal Operator during a MP-312 flight. The IUT will supervise all mission planning and mission performance.

Performance Standard. Be able to evaluate performance and correct deficiencies.

IUT-506 1.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Certification as an Internal Operator Instructor.

Requirement. The IUT will conduct instruction on any Internal Operator flight event.

Performance Standard. The IUT must organize the aircrew and supervise the mission planning within a reasonable time allowance. The IUT will brief the mission.

Prerequisites. IUT-500 through IUT-505.

2. Supporting Arms Control Instructor Under Training

a. Purpose. To develop proficiency and experience as an Supporting Arms Control Instructor. Upon completion, the IUT will be considered qualified to be designated as an UAV Supporting Arms Control Instructor.

b. General. Combat Qualification Training should be obtained prior to commencing instructor training. The Commanding Officer may waiver training requirements.

c. Ground Training. (1 Event, 3.5 hours).

d. Simulator Training. (1 Event, 1.0 hour). The IUT-511 be completed using the TSFO Trainer or CAS Training Facilities for SAC training.

IUT-510 3.5 GND C,R,E CREW POSITION: IUT

Goal. Conduct SAC-320 instruction.

Requirement. The IUT will conduct a SAC-310 training class.

Performance Standards. Be able to instruct a payload operator on the presets and light pen utilization as they apply to a fire support mission.

Prerequisite. IUT-506. Recommend formal instruction in supporting arms control and coordination (i.e. FO school, TACP course, etc.)

IUT-511 1.0 SIM/FLT C,R,E CREW POSITION: IUT

Goal. Demonstrate SAC-321 or SAC-322.

Requirement. The IUT may conduct a SAC-321 using the TSFO or CAS Trainer or SAC-322 actual flight.

Performance Standards. The IUT will be proficient in the call for fire, adjustment of fires and fire support weapon systems. Be able to evaluate performance and correct deficiencies.

Prerequisite. IUT-507.

Ordnance

(1) Eight 155mm HE

(2) Five 155mm WP

(3) Equivalent mortar/NSF ammunition may be substituted for the above.

External Syllabus Support. (1) 155mm Battery, (1) 81mm/60mm mortar section, (1) NSF support ship.

151. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS

1. JUAVTOPS Evaluation

a. Purpose. To ensure standards, procedures and requirements of the UAV JUAVTOPS Manual are complied with.

b. General

Written examinations must be completed prior to the flight event and current within 30 days.

(2) The JUAVTOPS Manual will be used as the reference for these events.

(3) At the completion of RQD-601, the IOUI can be designated by the commanding officer as a JUAVTOPS Internal Operator Evaluator.

c. Flight Training. (2 Flights, 4.0 hours).

RQD-600 2.0 FLT E RQ-2 (N) CREW POSITION: IO

Goal. Annual JUAVTOPS qualification.

Requirements. The Internal Operator will be required to man the IP and PO positions during this flight. Specific launch/recovery type is not required.

Performance Standards. All procedures listed in the JUAVTOPS Manual will be followed. Successfully passed open book, closed book and oral exams.

Prerequisite. Combat capable trained.

RQD-601 2.0 FLT E RQ-2 (N) CREW POSITION: JUAVTOPS IO EVAL

Goal. To certify the Internal Operator as a JUAVTOPS Internal Operator Evaluator.

Requirements. The Internal Operator will be required to evaluate a CK-600 flight in accordance with the JUAVTOPS Manual.

Performance Standards. IAW JUAVTOPS.

Prerequisite. Current CK-600 and designated as an Internal Operator Instructor.

2. UAV Shipboard Operations (SBO)

a. Purpose. To introduce the operator to UAV shipboard operations.

b. General. The operator should complete Combat Ready Phase training prior to executing these events.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (2 Flights, 1.0 hour).

SBO-610 1.0 GND C,R CREW POSITION: IO

Goal. Introduce the operator to UAV shipboard operations and terminology.

Requirement. The operator will be introduced to shipboard operations. Emphasis will be placed on LPDs equipped for UAV operations as well as LHA operations. Discuss shipboard launch/recovery, safety procedures, wave-off procedures, arrested deck landings, net recovery, controlling agencies and Base Recovery Course (BRC).

FCLP-611 1.0 FLT C,R RQ-2GCS (N) CREW POSITION: IO

Goal. Conduct Field Carrier Landing Practice.

Requirement. The operator will be introduced to FCLPs using a simulated LHA, LHD or LPD deck. The operator will observe 5 low approaches to a simulated net. Explain all safety procedures during shipboard operations.

Prerequisite. SBO-610.

SBO-612 1.0 FLT C,R RQ-2 (N) CREW POSITION: IO

Goal. Conduct UAV shipboard operations.

Requirement. The operator will be introduced to shipboard operations while occupying the IO position. This event will be completed while embarked on an LPD equipped for UAV operations. Review shipboard launch/recovery, safety procedures, wave off net recovery and controlling agencies.

Performance Standards. Launch and recover from a ship.

Prerequisites. SBO-610 and FCLP-611.

160. ORDNANCE REQUIREMENTS. Annual ordnance requirements are developed on a "per crew" basis per OPNAVNOTE 8010.

1. External Ordnance - BASIC/TRANS/CONV

ORDNANCE	100 SERIES	200 SERIES	300 SERIES	400 SERIES	REFRESHER	IUT	ANNUAL *
155mm HE (1)	0	0	8	0	8	8	8
155mm WP (1)	0	0	5	0	5	5	5
Note 1. Mortars or Naval Surface Fire can be substituted for the 155mm ammunition.							

*Annual Ordnance requirements maintain an aircrew member at proficiency.

AIRCRAFT: UAV MOS: 7314 CREW POSITION: INTERNAL OPERATOR

EVENT STAGE	CODE		HRS	REFLY INTERVAL	CRP	C	R	E	REMARKS	CREW POSITION
COMBAT READY PHASE										
FAM	200	GND	1.0	6	0.3	X	X			IO
	201	GND	1.0	6	0.3	X	X		RQ-2	IO
	202	FLT	1.0	6	1.0	X			GCS (N)	PO
	203	FLT	1.0	6	1.0	X			GCS (N)	IP
	204	FLT	1.0	6	1.0	X			GCS (N)	PO
	205	FLT	1.0	6	1.0	X			RQ-2 (N)	IP
	206	FLT	1.0	6	1.0	X	X		RQ-2 (N)	PO
	207	FLT	2.0	6	1.0	X	X		RQ-2 (N)	IP
NAV	210	GND	2.0	6	0.4	X	X			IO
	211	FLT	1.0	6	1.0				GCS	PO
	212	FLT	1.0	6	1.0	X	X		GCS N	PO
	213	FLT	1.0	6	1.0				GCS	IP
	214	FLT	1.0	6	1.0	X	X		GCS (N)	IP
NAV	220	FLT	1.0	6	1.0	X			GCS (N)	IP
	221	FLT	1.0	6	1.0	X	X		GCS (N)	IP
IOQM	230	FLT	2.0	*	1.0	X	X	X	GCS (N)	PO
	231	FLT	2.0	*	1.0	X	X	X	GCS (N)	IP
COMBAT QUALIFICATION PHASE										
TREC	300	GND	1.0	3	0.5	X	X			IO
	301	GND	1.0	3	0.5	X	X			IO
MP	310	GND	1.0	6	1.0	X	X			IO
	311	FLT	2.0	6	2.0				GCS (N)	IO
	312	FLT	2.0	6	2.0	X	X		GCS (N)	IO
SAC	320	GND	3.5	6	1.0	X	X			IO
	321	SIM/FLT	1.0	6	1.0					IO
	322	FLT	2.0	12	2.0	X	X		GCS (N)	PO
PCS	330	GND	1.0	6	1.0	X	X		PCS	IO
	331	FLT	1.0	6	2.0	X			PCS (N)	PO
	332	FLT	1.0	6	2.0	X	X		PCS (N)	IP
SSO	340	GND	1.0	6	1.0	X	X			IO
	341	FLT	1.0	6	2.0	X	X		PCS (N)	IP
	342	FLT	1.0	6	2.0	X	X		GCS (N)	IP
FULL-COMBAT QUALIFICATION PHASE										
AMP	400	GND	1.0	12	0.5	X				IO
	401	FLT	2.0	12	2.0	X	X		RQ-2	IO
OPS	410	GND	1.0	12	0.5	X				IO
	411	FLT	1.0	12	2.0	X	X		RQ-2 (N)	IP

Figure 1-2.--MOS 7314 Refly Interval, Combat Readiness Percentage

AIRCRAFT: UAV MOS: 7314 CREW POSITION: INTERNAL OPERATOR

STAGE	EVENT CODE	HRS	REFLY INTERVAL	CRP	C	R	E	REMARKS	CREW POSITION
INSTRUCTOR UNDER TRAINING									
Internal Operator Instructor Under Training									
IUT	500	GND	1.0	*	*	X	X	X		IUT
	501	GND	1.0	*	*	X	X	X	RQ-2	IUT
	502	FLT	2.0	*	*	X	X	X	RQ-2 (N)	IUT
	503	FLT	2.0	*	*	X	X	X	RQ-2 (N)	IUT
	504	GND	1.0	*	*	X	X	X		IUT
	505	FLT	2.0	*	*	X	X	X	RQ-2 (N)	IUT
	506	FLT	1.0	*	*	X	X	X	RQ-2 (N)	IUT
Supporting Arms Control Instructor Under Training									
IUT	510	GND	3.5	*	*	X	X	X		IUT
	511	SIM/FLT	1.0	*	*	X	X	X		IUT
REQUIREMENTS, QUALIFICATIONS, DESIGNATION									
RQD	600	FLT	2.0	12	*			X	RQ-2 (N)	IO
	601	FLT	2.0	12	*			X	RQ-2 (N)	IO
SBO	610	GRD	1.0	12	*		X	X		IO
FCLP	611	FLT	1.0	12	*		X	X	RQ-2 GCS (N)	IO
SBO	612	FLT	1.0	12	*		X	X	RQ-2 (N)	IO

Figure 1-2.--MOS 7314 Refly Interval, Combat Readiness Percentage

INTERNAL OPERATOR FLIGHT UPDATE CHAINING

STAGE	FLIGHT	FLIGHTS UPDATED
FAM	200	
	201	200
	202	200
	203	200,201
	204	200,201,202
	205	200,201,203
	206	200,201,202,204
	207	200,201,203,205
NAV	210	
	211	200,201,202,204,206,210
	212	200,201,202,204,206,210
	213	200,201,203,205,207,210
	214	200,201,203,205,207,210,213
NAV	220	200,201,203,205,207,213,214
	221	200,201,203,205,207,213,214,220
IOQM	230	200,201,202,204,208,210,211
	231	200,201,203,205,207,213,214,220,221
TREC	300	
	301	
MP	310	
	311	200,201,210,211,213
	312	200,201,210,211,213,311
SAC	320	
	321	320
	322	320,321
PCS	330	
	331	330
	332	330,331
SSO	340	
	341	330,331,332,340
	342	200,201,203,205,207,210,213,310,311,312,340
AMP	400	
	401	200,201,210,310,311,312,400
OPS	410	
	411	200,201,210,310,311,312,400,401,410

Figure 1-3.--Flight Update Chaining

CHAPTER 2

UNMANNED AERIAL VEHICLES (UAV) EXTERNAL OPERATOR

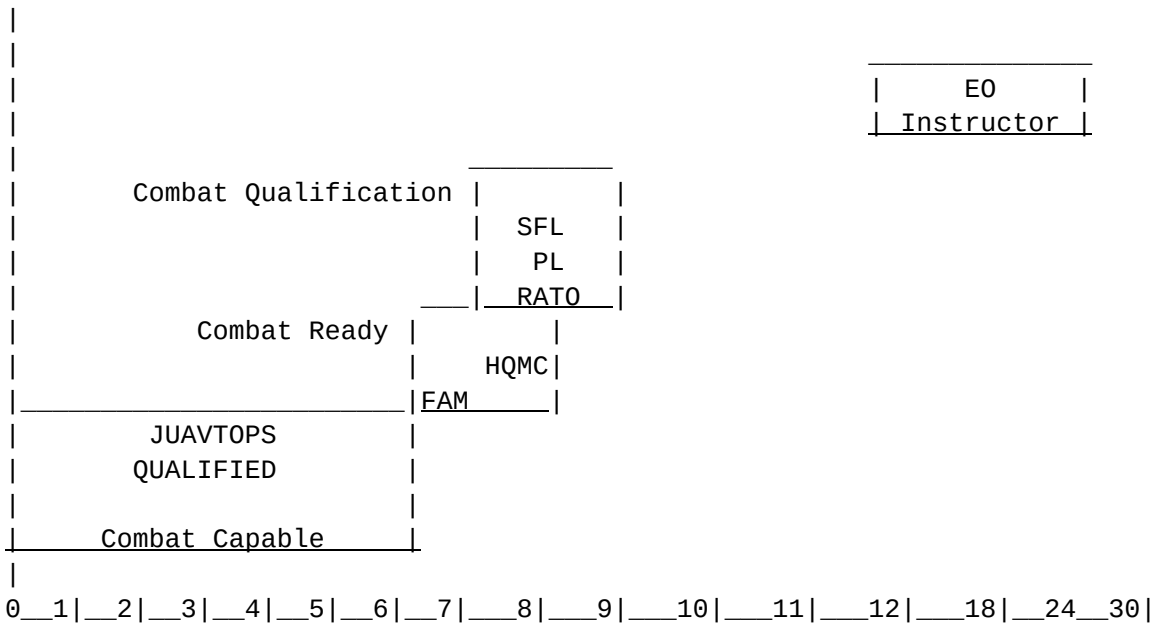

Figure 2-1.--External Operator Notional Training Model

200. PROGRAMS OF THE INSTRUCTION (POI) FOR BASIC, CONVERSION*, AND REFRESHER* EXTERNAL OPERATOR

WEEKS	COURSE	ACTIVITY
1-18*	Combat Capable	NAMTRAGRU DET AMTU 6001
19-29	Combat Ready	Tactical Squadron
30-38	Combat Qualification	Tactical Squadron

* Time to train is for Basic External Operator POI only. Combat Capable Refresher and Conversion POI are being developed for the External Operator.

210. GROUND/ACADEMIC TRAINING COURSES OF INSTRUCTION

COURSE	ACTIVITY
External Operator Course	NAMTRAGRU DET AMTU 6001
IO Ground/Flight Syllabus	Tactical Squadron
Medical	See OPNAVINST 3710.7__

211. SQUADRON LEVEL TRAINING

Publications and Related Directives
Communications Procedures
Maintenance Procedures
Safety
Weapons Training
MAWTS-1 Academic Support Package
Map Interpretation
Search and Rescue
Fueling and Servicing
Aircraft Recognition
Troubleshooting (Ground/In-flight)

220. PROGRAM OF INSTRUCTION FOR BASIC, CONVERSION AND REFRESHER EXTERNAL OPERATOR

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 241.

2. Combat Ready Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT	CRP PERCENT
Familiarization	3/2/3	3.0/1.5/2.5	13.0
External Operator Qualified in Model	0/0/1	0.0/0.0/1.0	2.0
Totals for phase	**3/2/4**	**3.0/1.5/3.5**	**15.0**
Combined Totals	**9**	**8.0**	**15.0**
Accumulation for Basic POI	**9**	**8.0**	**75.0**

3. Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT	CRP PERCENT
Rocket Assisted Take-Off	1/0/1	0.5/0.0/0.5	7.0
Pneumatic Launch	1/0/1	0.5/0.0/0.5	7.0
Short Field Landing	1/0/1	0.5/0.0/0.5	6.0
Totals for phase	**3/0/3**	**1.5/0.0/1.5**	**20.0**
Combined Totals	**6**	**3.0**	**20.0**
Accumulation for Basic POI	**15**	**11.0**	**95.0**

221. PROGRAM OF INSTRUCTION FOR INSTRUCTOR TRAINING

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Instructor Under Training	1/0/4	1.0/0/0/4.0
Total for IUT	**5**	**5.0**

222. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
RQD	0/0/2	0.0/0.0/1.5
Ship Board Operations	1/0/1	1.0/0.0/1.0
Total for RQD	**1/0/3**	**1.0/0.0/2.5**
	4	**3.5**

240. FLIGHT/SIMULATOR PERFORMANCE REQUIREMENTS

1. General

a. This manual generalizes mission guidance to allow for local conditions and to allow this manual to remain unclassified. CMC (A) and CG MCCDC encourage squadrons to use the full range of tactics in the tactical manuals and adopt the latest developed and proven tactics.

b. Compliance with written flight description is mandatory for syllabus flight completion. Events are listed as: FLT = Aircraft only, SIM = simulator only, GRD = Ground Event, FLT/SIM = Aircraft preferred/Simulator optional, or SIM/FLT = Simulator preferred/Aircraft optional. In the absence of a flight simulator, completion of a simulator syllabus event is not required to complete that stage. Completion of those events should be accomplished as soon as practicable upon simulator availability. Should the command desire, simulator events can be flown as actual flight events for T&R credit. ACT will be stressed and evaluated throughout each stage.

c. All events shall terminate with a comprehensive debrief with emphasis on the aircrew's performance using all evaluation techniques.

d. External Operators shall fly events annotated with an "N" at least 30 minutes after official sunset. Events annotated with "(N)" may be conducted either in the day or night.

2. Syllabus Assignment

a. Basic external operators will be assigned to fly the entire syllabus. Conversions and Refreshers will fly the flights designated by a "C" or "R" respectively in the flight description.

b. Refresher Syllabus. The refresher syllabus is predicated on the experience of the refresher External Operator. An External Operator in the refresher syllabus should fly all "R" coded events. **However, a refresher External Operator need not fly every event within a stage of training to be requalified in that stage. The Commanding Officer may tailor the refresher syllabus to fit the experience of the refresher External Operator per MCO P3500.14F**. When the "R" coded events within a stage of training are complete, the External Operator may be credited with the CRP from the entire stage of training. This assumes that the refresher has had previous proficiency in that stage of training. If the refresher External Operator has no previous proficiency in a stage or particular event, then the refresher should fly the entire stage or all events not previously flown. The refresher syllabi applies only up to the stage achieved during the prior tour, after that the External Operator will complete the entire remaining syllabus.

3. Aircrew Evaluation Flights. All external operators shall have a JUAVTOPS evaluation form filled out annually upon completion of the annual JUAVTOPS Check (RQD-600). A designated JUAVTOPS instructor or an assistant JUAVTOPS instructor shall evaluate RQD-600.

4. Aircrew Training Forms (ATFs)

a. An ATF is required for any initial flight of any event completed by a Basic, Conversion, or Refresher External Operator or as recommended by the squadron Standardization Board.

b. If the Commanding Officer has waived a syllabus event, the squadron training officer shall place a waiver letter in section 3 of the APR.

5. Instructor Requirements. The minimum instructor requirements are listed for each T&R event.

6. Flight Completion. Compliance with the written flight description is mandatory for syllabus flight completion. Times indicated for each flight are only recommendations.

7. Weight and Balance. Weight and balance sheets will be completed per JUAVTOPS guidelines and Standard Operating Procedures.

8. Crew Requirements/Position Designations. Crew requirements are listed for each event. Crew position is designated at right margin of event header.

9. Previous Qualification. Refresher external operators previously qualified in any syllabus stage should fly only those "R" coded flights. If not previously qualified, they shall fly the full basic syllabus for those stages.

10. Sequence. Training should be accomplished by conducting events within a stage in sequence and stages in sequence when practical.

11. Definitions

a. Discuss

(1) The External Operator Instructor shall discuss a procedure or maneuver during the brief, in flight, or debrief.

(2) The External Operator Under Instruction is responsible for knowledge of the applicable procedures prior to the briefing.

b. Demonstrate

(1) The EOI performs the maneuver with accompanying description.

(2) The EOUI observes the maneuver and is responsible for the knowledge of the procedures prior to the flight.

c. Introduce

(1) At his option, the EOI may perform the maneuver with an accompanying description, or he may coach the EOUI through the maneuver without demonstration.

(2) The EOUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight.

d. Review

(1) The EOI observes and grades the maneuver without coaching the EOUI. An airborne critique of the EOUIs performance is at the option of The instructor.

(2) The EOUI is expected to perform the maneuver without coaching and devoid of procedural error at a level acceptable to warrant progress into the next stage of training.

241. COMBAT CAPABLE PHASE

1. General

a. Combat Capable instruction consists of military and contractor training conducted at the designated training unit. Syllabus description and requirements are available in the current edition of the Training unit's syllabus.

b. Basic System Familiarizations. Basic system/EO familiarization and qualification will be obtained during the Combat Capable Training at the designated training unit. The following stages make up the basic system familiarization and qualification portion of the Combat Capable Training (based on the established Training Unit Class outline): Introduction to the Pioneer UAV system, GCS, PCS and TCU, Equipment familiarization, system operating modes, payloads, autopilot, UAV system operating procedures, mission planning, map reading, aerial navigation, emergency procedures and UAV launch/recovery systems.

c. Omitted Sorties. Training events which are not completed in the Combat Capable Phase shall be conducted in the succeeding phase of training.

d. Evaluation Sorties. Designated evaluation sorties should be conducted with a qualified EO instructor or experienced Mission Commander.

2. Syllabus Assignments. The EO should complete the entire Combat Capable Phase before advancing to the next phase.

3. Re-fly Intervals. Listed in the training unit's syllabus.

4. Combat Capable Phase Purpose. Upon completion of Combat Capable Phase, the EO is considered a JUAVTOPS qualified to be designated as a squadron External Operator by the commanding officer.

5. Combat Capable Syllabus Objectives. Listed below are the titles of the learning objectives areas associated with the entry level training syllabus for Pioneer UAV External Operators. This course of instruction is conducted by NAMTRAGRU DET AMTU 6001, Fort Huachuca, Arizona. Detailed descriptions of each area available from NAMTRAGRU.

1) Basic Aerodynamics.
2) FAA Regulation/Procedures.
3) Ground/Flight Safety and Mishap Procedures/Reporting.
4) Aircrew Coordination.
5) SOP and Course Rules.
6) JUAVTOPS Checklist Procedures.
7) JUAVTOPS and Aircrew Training Records.
8) Weather and Factors affecting UAV Operations.
9) Technical/Maintenance Documentation.
10) Emergency Procedures.
11) Pioneer UAV.
12) Ground Control Station.
13) Tracking Communications Unit.
14) Portable Control Station.
15) System Limitations.
16) Day Payload.
17) Night Payload.
18) Briefing/Debriefing.
19) Modes of Launch/Recovery.
20) Flight Modes.
21) Aircrew Training Documentation.
22) MIG (R/C) performance flights.
23) Pioneer half-scale performance flights.
24) Performance Flights (local and range).
25) JUAVTOPS Check Ride.

242. COMBAT READY PHASE

1. Familiarization (FAM)

a. Purpose. To develop proficiency and experience in tactical UAV system operation and to emphasize the importance of crew coordination, common terminology, and familiarization with local SOPs.

b. General

(1) To be trained in this portion of the academic and flight syllabus all External Operators will have at a minimum an interim secret clearance.

(2) All flights on student box with instructor.

c. Ground Training. (3 Events, 3.0 hours). Where required, ground (GND) syllabus events have been scheduled to augment the flight syllabus requirements. These events can be executed in conjunction with the flight events. However, the completion of the ground training event prior to its corresponding flight is mandatory. Ground events can not update or replace the corresponding flight event.

d. Simulator Training. (2 Flights, 1.5 hours). The External Operator will demonstrate flight skills using a simulator, RC trainer or half scale trainer prior to flying the full scale UAV. These flights should be conducted whenever the External Operator has not flown in 30 days.

e. Flight Training. (3 Flights, 2.5 hours).

FAM-200 1.0 GND C,R CREW POSITION: EO

Goal. Introduce the operator to the area of operation, unit SOP, local course rules and regulations.

Requirement. The External Operator will successfully complete the annual course rules exam and squadron SOP exam.

Performance Standards. Pass an open/closed book written exam with a Minimum score of 80%.

FAM-201 1.0 GND C,R RQ-2 CREW POSITION: EO

Goal. Review the UAV system, crew coordination and system pre-flight/post flight requirements.

Requirement. Review/discuss all components of the system, crew coordination, pre-flight of the UAV, all system components and individual responsibilities, RATO/Pnuematic Launch procedures, and post flight procedures.

Performance Standards. During a practical application, IAW JUAVTOPS and unit SOP, EO under instruction will conduct all pre and post flight procedures.

FAM-202 0.5 SIM C,R R/C CREW POSITION: EO

Goal. Conduct flight pattern management as an External Operator.

Requirement. The EO under instruction will conduct flight pattern Management using a R/C trainer, or Half Scale Trainer.

Performance Standards. IAW JUAVTOPS, the EO must complete a minimum of one launch, five touch and go's, and one recovery.

Prerequisites. FAM-200, FAM-201.

FAM-203 1.0 SIM C,R R/C CREW POSITION: EO

Goal. Introduce and conduct emergency procedures as an External Operator.

Requirement. The EO under instruction will conduct the emergency procedures for: engine cut, high idle, stuck throttle and flight control malfunctions using a R/C trainer or Half Scale Trainer.

Performance Standards. IAW JUAVTOPS, the EO must complete a minimum of five touch and go's, and recovery under simulated emergency conditions.

Prerequisite. FAM-202.

FAM-204 0.5 FLT C,R RQ-2 CREW POSITION: EO

Goal. Introduce the EO to the area of operation, area regulations, and local procedures.

Requirement. The EO under instruction will be introduced to the local area of operation. The EO under instruction will review local rules and regulations. The EO under instruction will be required to conduct UAV taxi, launch, conduct control checks, dish lock and recovery.

Performance Standards. IAW JUAVTOPS, the EO must complete a minimum of three touch and go's, one successful dish lock and one recovery.

Prerequisite. FAM-203.

FAM-205 1.0 FLT C,R RQ-2 CREW POSITION: EO

Goal. Conduct correct emergency procedures.

Requirement. While operating the Pioneer UAV, the EO under instruction will conduct simulated emergency procedures. The EOI will review and demonstrate auto-pilot disconnect procedures prior to the student conducting them.

Performance Standard. The EO will, IAW JUAVTOPS, during simulated emergencies, conduct correct emergency procedures for engine cut, high idle, stuck throttle and flight control malfunctions.

Prerequisites. FAM-203, FAM-204.

FAM-206 1.0 GND C,R N CREW POSITION: EO

Goal. Introduce the External Operator to UAV night operations.

Requirement. The EO will be introduced to requirements associated with the lighting of the runway and the UAV and launch/recovery site. Review and discuss specific emergency procedures that may change during night operations, night operating and safety procedures and area rules and regulations for night UAV operations.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

Prerequisites. FAM-204.

FAM-207 1.0 FLT C,R RQ-2 N CREW POSITION: EO

Goal. Introduce UAV night operations.

Requirement. The EO under instruction will conduct UAV night operations, including pre-flight procedures, launch procedures, control checks, flight pattern management, dish lock and recovery using night operating procedures. The EO under instruction must conduct emergency procedures during simulated emergencies.

Performance Standards. IAW JUAVTOPS, the EO must complete the launch, five touch and go's and recovery. The EO will, IAW JUAVTOPS, during simulated emergencies, conduct correct emergency procedures for engine cut, high idle, stuck throttle and flight control malfunctions.

Prerequisite. FAM-206.

3. External Operator Qualification in Model (EOQM)

a. Purpose. To certify the External Operator Under Instruction as an External Operator Qualified in Model (EOQM).

b. General. At the completion of this EOQM-210 the operator is considered External Operator Qualified in Model and may be designated as EOQM by the commanding officer.

c. Prerequisite. The Combat Ready Phase of training must be completed prior to this flight.

d. Flight Training. (1 Flight, 1.0 hours).

EOQM-210 1.0 FLT C,R,E RQ-2 (N) CREW POSITION: EO

Goal. Combat Ready check for the EO position.

Requirement. The EO under instruction will conduct pre-flight, launch, flight pattern management, control checks, dish lock and recovery procedures. The EO under instruction shall conduct simulated emergency procedures.

Performance Standards. The EO, IAW JUAVTOPS, will conduct the pre-flight, launch, control checks, flight pattern management, a minimum of 5 touch and go's and a recovery. The EO will, IAW JUAVTOPS, during simulated emergencies, conduct correct emergency procedures for engine cut, high idle, stuck throttle and flight control malfunctions.

Prerequisite. FAM-205, FAM-207.

243. COMBAT QUALIFICATION PHASE

1. Rocket Assisted Take Off Operations (RATO)

a. Purpose. To introduce, develop proficiency and experience in the UAV RATO Launch operations.

b. General. The EO must have completed FAM 200 through 205 prior to conducting these events.

c. Ground Training. (1 Event, 0.5 hour). RATO-300 must be completed prior to the execution of RATO-301.

d. Flight Training. (1 Flight, 0.5 hour).

RATO-300 0.5 GND C,R RQ-2 (N) CREW POSITION: EO

Goal. Introduce the EO to RATO launch.

Requirement. Discuss RATO launch safety procedures (ground and in flight), RATO pre-flight procedures, launch sequence and emergency procedures. If available the operator will observe an actual RATO launch or a video of a RATO launch during this training period.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

Prerequisites. FAM-200 through FAM-205. If a night event, FAM-207.

RATO-301 0.5 FLT C,R RQ-2 (N) CREW POSITION: EO

Goal. Conduct a RATO launch while occupying the EO position.

Requirement. Prior to conducting the RATO launch, review RATO safety procedures, pre-flight procedures, launch sequence and emergency procedures. The EO under instruction will conduct all RATO pre-flight, and launch events, and execute emergency procedures for simulated RATO emergencies.

Performance Standards. IAW JUAVTOPS, the EO will successfully conduct, on the student box, all RATO events.

Prerequisites. RATO-300.

Ordnance. One MK125 MOD1 Rocket Motor.

2. Pneumatic Launcher Operations (PL)

a. Purpose. To introduce, develop proficiency and experience in the UAV Pneumatic Launch operations.

b. General. The EO must have completed the FAM-200 through FAM-205 Combat Ready Training prior to conducting these events.

c. Ground Training. (1 Event, 0.5 hour). These events must be completed prior to the execution of the related flight events.

d. Flight Training. (1 Flight, 0.5 hour).

PL-310 0.5 GND C,R (N) CREW POSITION: EO

Goal. Introduce the EO to Pneumatic Launch.

Requirement. Discuss Pneumatic Launcher safety procedures, Pneumatic Launcher pre-flight procedures, safety considerations, launch sequence of events and related emergency procedures. If available the operator will observe an actual Pneumatic Launch or a video of a Pneumatic Launch during this training period.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

Prerequisites. FAM-200 through FAM-205. If a night event, FAM-207.

PL-311 0.5 FLT C,R RQ-2 (N) CREW POSITION: EO

Goal. Conduct a Pneumatic Launch while occupying the EO position.

Requirement. Prior to conducting the Pneumatic Launch, review Pneumatic Launch safety procedures, pre-flight procedures, launch sequence and emergency procedures. The EO under instruction will conduct all Pneumatic Launch pre-flight, launch events, and execute emergency procedures for simulated Pneumatic Launcher emergencies.

Performance Standards. IAW JUAVTOPS, the EO will successfully conduct, on the student box, all Pneumatic Launcher events.

Perquisites. PL-310.

3. Short Field Landing Operations (SFL)

a. Purpose. To introduce the EO to advanced UAV operations, to include short field landings.

b. General. The EO must have completed the FAM-200 through FAM-205 Combat Ready Training prior to conducting these event.

c. Ground Training. (1 Event, 0.5 hour). This event must be completed prior to execution of the related flight events.

d. Flight Training. (1 Flight, 0.5 hour).

SFL-320 0.5 GND C,R RQ-2 (N) CREW POSITION: EO

Goal. Introduce the EO to Short Field Landings.

Requirement. The EO will be introduced to Short Field Landings. The discussion should place primary emphasis on amphibious deck operations and confined locations where preferred runway dimensions are not available.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

Prerequisites. FAM-200 through FAM-205. If a night event, FAM-207.

SFL-321 0.5 FLT C,R RQ-2 (N) CREW POSITION: EO

Goal. Conduct a Short Field Landing while occupying the EO position.

Requirement. The EO under instruction will conduct Short Field Landings. Primary emphasis should be placed on amphibious deck operations and confined locations where preferred runway dimensions are not available.

Performance Standards. IAW JUAVTOPS, the EO will conduct one short field landing.

Prerequisites. FAM-200 through FAM-205. a night event, FAM-207.

250. EXTERNAL OPERATOR INSTRUCTOR UNDER TRAINING (IUT)

1. Purpose. To train the External Operator in procedures required to instruct UAV EOs in Combat Ready and Combat Qualification phases of the syllabus.

2. General. External Operator must have completed the Combat Qualification Phase. Upon completion of the IUT syllabus the EO may be designated an EO Instructor.

3. Ground Training. (1 Event, 1.0 hour).

4. Flight Training. (4 Flights, 4.0 hours).

IUT-500 1.0 GND C,R,E CREW POSITION: IUT

Goal. Discuss instruction techniques and instructor responsibilities. Conduct classroom instruction.

Requirement. The IUT will receive a period of instruction on instruction techniques and instructor duties. This instruction will cover all administrative duties, JUAVTOPS requirements, aircrew training, record keeping, and evaluation documentation.

Performance Standards. Completion of an open/closed book examination, oral examination with a minimum score of 80%. Satisfactory delivery of a prepared lesson plan.

Prerequisites. Completion of Combat Qualification Phase.

IUT-501 1.0 FLT C,R,E RQ-2 CREW POSITION: IUT

Goal. Conduct instruction during FAM-204 and FAM-205.

Requirement. The IUT will conduct instruction during FAM-204 and FAM-205 flight events. The IUT will complete an ATF on the student.

Performance Standards. IUT successfully identifies and corrects deficiencies that are noted during training. IUT correctly documents student training on the Aircrew Training Forms.

Prerequisites. IUT-500.

IUT-502 1.0 FLT C,R,E RQ-2 N CREW POSITION: IUT

Goal. Conduct instruction during FAM-207.

Requirement. The IUT will conduct instruction during FAM-207. The IUT will complete an ATF on the student.

Performance Standards. IUT successfully identifies and corrects deficiencies that are noted during training. IUT correctly documents student training on the Aircrew Training Forms.

Prerequisites. IUT-501.

IUT-503 1.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Conduct instruction during RATO-301 or PL-311.

Requirement. The IUT will demonstrate the ability to conduct instruction during flight training for a RATO-301 or PL-311. The IUT will complete an ATF on the student.

Performance Standards. IUT successfully identifies and corrects deficiencies that are noted during training. IUT correctly documents student training on the Aircrew Training Forms.

Prerequisites. IUT-502.

IUT-504 1.0 FLT C,R,E RQ-2 (N) CREW POSITION: IUT

Goal. Conduct instruction during SFL-321.

Requirement. The IUT will demonstrate the ability to conduct instruction during flight training for a SFL-321. The IUT will complete an ATF on the student.

Performance Standards. IUT successfully identifies and corrects deficiencies that are noted during training. IUT correctly documents student training on the Aircrew Training Forms.

Prerequisites. IUT-502.

251. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS (RQD)

1. JUAVTOPS EVALUATION

a. Purpose. To ensure standards, procedures and requirements of the JUAVTOPS Manual are complied with.

b. General

(1) Written examinations must be completed prior to flight event and current within 30 days.

(2) The JUAVTOPS will be used as the reference for these events.

c. Ground Training. Per the JUAVTOPS Manual.

d. Flight Training. (2 Flights, 1.5 hours). These flights are simulator optional.

RQD-600 1.0 FLT/SIM C,R,E RQ-2 (N) (A/S) CREW POSITION: EO

Goal. Annual JUAVTOPS qualification.

Requirement. The EO will be required to conduct pre-flight, launch, control checks, touch and go's, dish lock and recovery procedures in accordance with the JUAVTOPS. Additionally, the EO will be required to conduct simulated emergency procedures.

Performance Standard. IAW JUAVTOPS, the EO will be required to conduct pre-flight, launch, control checks, five touch and go's, dish lock and recovery procedures. Additionally, the EO will be required to conduct simulated emergency procedures.

Prerequisite. Completion of EOQM-210.

RQD-601 0.5 FLT/SIM C,R,E ALL (N)(A/S) CREW POSITION: EO

Goal. Designation as a JUAVTOPS Evaluator.

Requirement. The EO will be required to evaluate a RQD-600 flight.

Performance Standards. IUT successfully identifies and corrects deficiencies that are noted during training. IUT correctly documents student training on the Aircrew Training Forms. Upon successful completion of this event the EO may be designated as an JUAVTOPS Evaluator.

Prerequisite. External Operator Instructor.

2. Shipboard Operations (SBO)

a. Purpose. To develop experience in operating UAVs aboard amphibious ships.

b. General. The EO must have completed Combat Qualification Training prior to commencing this stage of training.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (1 Flight, 1.0 hour).

SB0-610 1.0 GND C,R CREW POSITION: EO

Goal. Introduce shipboard operations.

Requirement. Discuss all aspects of UAV ship board operations, procedures and safety. Ships should include LPD, LHD and LHA.

Performance Standards. Completion of an oral examination with a score of 80%.

Prerequisites. Completion of Combat Qualification Phase.

SBO-611 1.0 FLT C,R RQ-2 (N) CREW POSITION: EO

Goal. Introduce shipboard operations.

Requirements. Review JUAVTOPS shipboard procedures. Introduce the EO to operations from aboard ship. This event will be conducted using a simulated ship.

Performance Standard. The EO will conduct five low approaches to a simulated net.

Prerequisite. SBO 610.

260. ORDNANCE REQUIREMENTS. Annual ordnance requirements are developed on a "per crew" basis per OPNAVNOTE 8010.

1. Expendable Ordnance - BASIC/TRANS/CONV

ORDNANCE	100 SERIES	200 SERIES	300 SERIES	400 SERIES	REFRESHER	IUT	ANNUAL*
	1	0	1	0	1	0	1

*Annual Ordnance requirements maintain an aircrew member at proficiency.

AIRCRAFT: UAV MOS: 7316 POSITION: EXTERNAL OPERATOR

STAGE	EVENT CODE		HRS	REFLY INTERVAL	CRP	C	R	E	REMARKS	CREW POSITION
COMBAT READY PHASE										
FAM	200	GND	1.0	12	1.0	X	X	X		EO
	201	GND	1.0	6	1.0	X	X		RQ-2	EO
	202	SIM	0.5	6	2.0	X	X		R/C	EO
	203	SIM	1.0	6	2.0	X	X		R/C	EO
	204	FLT	0.5	6	2.0	X	X		RQ-2	EO
	205	FLT	1.0	6	1.0	X	X		RQ-2	EO
	206	GND	1.0	6	2.0	X	X		N	EO
	207	FLT	1.0	6	2.0	X	X		RQ-2 N	EO
EOQM	210	FLT	1.0	*	2.0	X	X	X	RQ-2 (N)	EO
COMBAT QUALIFICATION PHASE										
RATO	300	GND	0.5	12	3.0	X	X		RQ-2 (N)	EO
	301	FLT	0.5	12	4.0	X	X		RQ-2 (N)	EO
PL	310	GND	0.5	12	3.0	X	X		(N)	EO
	311	FLT	0.5	12	4.0	X	X		RQ-2 (N)	EO
SFL	320	GND	0.5	12	2.0	X	X		RQ-2 (N)	EO
	321	FLT	0.5	12	4.0	X	X		RQ-2 (N)	EO
INSTRUCTOR UNDER TRAINING										
IUT	500	GND	1.0	*		X	X	X		IUT
	501	FLT	1.0	*		X	X	X	RQ-2	IUT
	502	FLT	1.0	*		X	X	X	RQ-2 N	IUT
	503	FLT	1.0	*		X	X	X	RQ-2 (N)	IUT
	504	FLT	1.0	*		X	X	X	RQ-2 (N)	IUT
REQUIREMENTS, DESIGNATIONS, QUALIFICATIONS										
RQD	600	FLT/SIM	1.0	12		X	X	X	RQ-2 (N)	EO
	601	FLT/SIM	0.5	12		X	X	X	RQ-2 (N)	EO
SBO	610	GND	1.0	*		X	X			EO
	611	FLT	1.0	*		X	X		RQ-2 (N)	EO

Figure 2-2.--MOS 7316 Refly Interval, Combat Readiness Percentage

EXTERNAL OPERATOR FLIGHT UPDATE CHAINING

STAGE	FLIGHT	FLIGHTS UPDATED
FAM	200	
	201	
	202	201
	203	201,202
	204	201,202,203
	205	201,202,203,204
	206	
	207	201,202,203,204,205,206
EOQM	210	201,202,203,204,205
RATO	300	
	301	300
PL	310	
	311	310
SFL	320	
	321	320

Figure 2-3.--Flight Update Chaining

CHAPTER 3

UNMANNED AERIAL VEHICLES (UAV) MISSION COMMANDER (75XX/72XX)

FIGURES

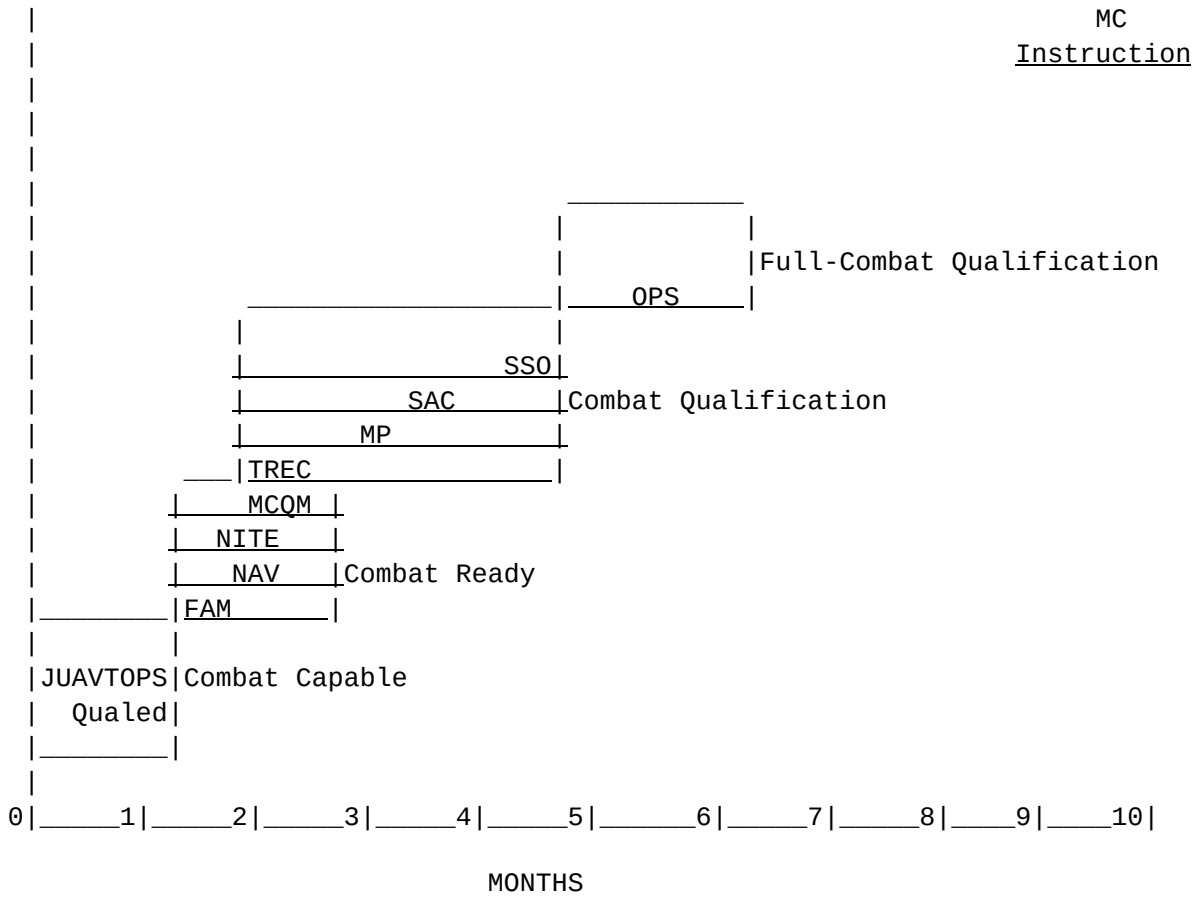

Figure 3-1.--Mission Commander Notional Training Model

300. PROGRAM OF THE INSTRUCTION (POI) FOR BASIC AND CONVERSION MISSION COMMANDER

WEEKS	COURSE	ACTIVITY
1-3	Combat Capable	NAMTRAGRU DET AMTU 6001
4-7	Combat Ready	Tactical Squadron
8-11	Combat Qualification	Tactical Squadron
12-15	Full-Combat Qualification	Tactical Squadron

301. POI FOR REFRESHER MISSION COMMANDER

WEEKS	COURSE	ACTIVITY
*	Combat Capable	NAMTRAGRU DET AMTU 6001
1-4	Combat Ready	Tactical Squadron
5-8	Combat Qualification	Tactical Squadron
9-12	Full-Combat Qualification	Tactical Squadron

* Combat Capable Refresher POI is being developed by NAMTRAGRUDET AMTU 6001

310. GROUND/ACADEMIC TRAINING COURSES OF INSTRUCTION

COURSE	ACTIVITY
Mission Commander Course	NAMTRAGRU DET AMTU 6001
MC Ground/Flight Syllabus	Tactical Squadron
Medical	See OPNAVINST 3710.7__

311. SQUADRON LEVEL TRAINING

Publications and Related Directives
Communications Procedures
Maintenance Procedures
Safety
Weapons Training
MAWTS-1 Academic Support Package
Map Interpretation
Search and Rescue
Fueling and Servicing
Aircraft Recognition
Troubleshooting (Ground/In-flight)

320. PROGRAM OF INSTRUCTION FOR BASIC AND CONVERSION MISSION COMMANDER

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 341.

2. Combat Ready Phase

	EVENTS	HOURS	CRP
STAGE	GND/SIM/FLT	GND/SIM/FLT	PERCENT
Familiarization	3/0/3	4.0/0.0/4.0	7.0
Navigation	0/0/2	0.0/0.0/3.0	3.0
Night Operations	1/0/1	1.0/0.0/1.0	3.0
Mission Commander Qualified in Model	0/0/1	0.0/0.0/2.0	2.0
Totals for phase	**4/0/7**	**5.0/0.0/10.0**	**15.0**
Combined Totals	**11**	**15.0**	**15.0**
Accumulation for Basic POI	**11**	**15.0**	**75.0**

3. Combat Qualification Phase

	EVENTS	HOURS	CRP
STAGE	GND/SIM/FLT	GND/SIM/FLT	PERCENT
Threat Recognition	2/0/0	2.0/0.0/0.0	4.0
Mission Planning	1/0/2	3.0/0.0/4.0	6.0
Supporting Arms Control	1/1/1	3.5/1.0/2.0	6.0
Split Site Operations	1/0/1	1.0/0.0/1.0	4.0
Totals for phase	**5/1/4**	**9.0/1.0/7.0**	**20.0**
Combined totals	**10**	**17.0**	**20.0**
Accumulation for Basic POI	**21**	**32.0**	**95.0**

4. Full-Combat Qualification Phase

	EVENTS	HOURS	CRP
STAGE	GND/SIM/FLT	GND/SIM/FLT	PERCENT
Dual Operations	1/0/1	1.0/0.0/1.0	5.0
Totals for phase	**1/0/1**	**1.0/0.0/1.0**	**5.0**
Combined totals	**2**	**2.0**	**5.0**
Totals for Basic POI	**23**	**34.0**	**100.0**

321. PROGRAM OF INSTRUCTION FOR REFRESHER MISSION COMMANDER

1. Combat Capable Phase. This portion of the syllabus is conducted at Ft Huachuca, AZ by NAMTRAGRU DET AMTU 6001. See paragraph 341.

2. Combat Ready Phase

	EVENTS	HOURS
STAGE	GND/SIM/FLT	GND/SIM/FLT
Familiarization	3/0/2	4.0/0.0/3.0
Navigation	0/0/1	0.0/0.0/1.5
Night Operations	0/0/1	0.0/0.0/1.0
Mission Commander Qualified in Model	0/0/1	0.0/0.0/2.0
Totals for phase	**3/0/5**	**4.0/0.0/7.0**
Combined Totals	**8**	**11.0**
Accumulation for Basic POI	**8**	**11.0**

3. Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Mission Planning	1/0/1	3.0/0.0/2.0
Supporting Arms Control	1/1/1	3.5/1.0/2.0
Split Site Operations	1/0/1	1.0/0.0/1.0
Totals for phase	**3/1/3**	**7.5/1.0/5.0**
Combined totals	**7**	**13.5**
Accumulation for Basic POI	**15**	**24.5**

4. Full-Combat Qualification Phase

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
Dual Operations	1/0/1	1.0/0.0/1.0
Totals for phase	**1/0/1**	**1.0/0.0/1.0**
Combined totals	**2**	**2.0**
Totals for Basic POI	**17**	**26.5**

322. PROGRAM OF INSTRUCTION FOR INSTRUCTOR TRAINING

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
IUT	4/1/4	7.5/1.0/9.5
Total for IUT	**9**	**18.0**

323. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS

STAGE	EVENTS GND/SIM/FLT	HOURS GND/SIM/FLT
RQD	0/0/2	0.0/0.0/4.0
Total for RQD	**2**	**4.0**

340. FLIGHT/SIMULATOR PERFORMANCE REQUIREMENTS

1. General

a. This manual generalizes mission guidance to allow for local conditions and to allow this manual to remain unclassified. CMC (A) and CG MCCDC encourage squadrons to use the full range of tactics in the tactical manuals and adopt the latest developed and proven tactics.

b. Compliance with written flight description is mandatory for syllabus flight completion. Events are listed as: FLT = Aircraft only, SIM = simulator only, GRD = Ground Event, FLT/SIM = Aircraft preferred/Simulator optional, or SIM/FLT = Simulator preferred/Aircraft optional. In the absence of a flight simulator, completion of a simulator syllabus event is not required to complete that stage. Completion of those events should be accomplished as soon as practicable upon simulator availability. Should the command desire, simulator events can be flown as actual flight events for T&R credit. ACT will be stressed and evaluated throughout each stage.

c. All events shall terminate with a comprehensive debrief with emphasis on the aircrew's performance using all evaluation techniques.

d. Mission Commanders shall fly events annotated with an "N" at least 30 minutes after official sunset. Events annotated with "(N)" have the option of flying in the day or night.

2. Syllabus Assignment

a. Basic mission commanders will be assigned to complete the entire syllabus. Conversions and Refreshers will complete the events designated by a "C" or "R" respectively in the event description.

b. Refresher Syllabus. The refresher syllabus is predicated on the experience of the refresher Mission Commander. An Mission Commander in the refresher syllabus should fly all "R" coded events. **However, a refresher Mission Commander need not fly every event within a stage of training to be requalified in that stage. The Commanding Officer may tailor the refresher syllabus to fit the experience of the refresher Mission Commander per MCO P3500.14F**. When the "R" coded events within a stage of training are complete, the Mission Commander may be credited with the CRP from the entire stage of training. This assumes that the refresher has had previous proficiency in that stage of training. If the refresher Mission Commander has no previous proficiency in a stage or particular event, then the refresher should fly the entire stage or all events not previously flown. The refresher syllabi applies only up to the stage achieved during the prior tour, after that the Mission Commander will complete the entire remaining syllabus.

3. Aircrew Evaluation Flights. All mission commanders shall have a JUAVTOPS evaluation form filled out annually upon completion of the following:

a. JUAVTOPS Check (RQD-600). A designated JUAVTOPS instructor or an assistant JUAVTOPS instructor shall evaluate RQD-600.

4. Aircrew Training Forms (ATFs)

a. An ATF is required for any initial flight of any sortie completed by a Basic, Transition, Conversion, or Refresher Mission Commander or as recommended by the squadron Standardization Board.

b. If the Commanding Officer has waived a syllabus sortie, the squadron training officer shall place a waiver letter in section 3 of the APR.

5. Instructor Requirements. The minimum instructor requirements are listed for each event.

6. Flight Completion. Compliance with the written flight description is mandatory for syllabus flight completion. Times indicated for each flight are only recommendations.

7. Weight and Balance. Weight and balance sheets will be completed per JUAVTOPS guidelines and Standard Operating Procedures.

8. Crew Requirements/Position Designations. Crew requirements are listed for each event. Crew position is listed at the right margin in the event header.

9. Previous Qualification. Refresher mission commanders previously qualified in any syllabus stage should fly only those "R" coded flights. If not previously qualified, they shall fly the full basic syllabus for those stages.

10. Sequence. Training should be accomplished by flying events within a stage in sequence and stages in sequence when practical.

11. Definitions

a. Discuss

(1) The MCI shall discuss a procedure or maneuver during the brief, in flight, or debrief.

(2) The MCUI is responsible for knowledge of the applicable procedures prior to the briefing.

b. Demonstrate

(1) The MCI performs the maneuver with accompanying description.

(2) The MCUI observes the maneuver and is responsible for the knowledge of the procedures prior to the flight.

c. Introduce

(1) At his option, the MCI may perform the maneuver with an accompanying description, or he may coach the MCUI through the maneuver without demonstration.

(2) The MCUI shall perform the maneuver with coaching as necessary and is responsible for knowledge of the procedures prior to the flight.

d. Review

(1) The MCI observes and grades the maneuver without coaching the MCUI. An airborne critique of the MCUIs performance is at the option of the instructor.

(2) The MCUI is expected to perform the maneuver without coaching and devoid of procedural error at a level acceptable to warrant progress into the next stage of training.

341. COMBAT CAPABLE PHASE

1. General

a. The Combat Capable Instruction consists of military and contractor training conducted at the designated training unit. Syllabus description and requirements are available in the current edition of the Training unit's syllabus.

b. Basic System Familiarization. Basic system familiarization and qualification will be obtained during the Combat Capable Training at the designated training unit. The following stages make up the basic system familiarization and qualification portion of the Combat Capable Training (based on the established Training Unit Class outline): Introduction to the Pioneer UAV system, GCS, PCS and TCU, RRS, Equipment familiarization, system operating modes, payloads, autopilot, UAV system operating procedures, mission planning, map reading, aerial navigation, emergency procedures and UAV launch/recovery systems.

c. Omitted Sorties. Flight training events which are not flown in the Combat Capable Training shall be flown in the succeeding stage of training.

d. Evaluation Sorties. Designated evaluation sorties should be flown with a qualified MC instructor or experienced Mission Commander.

2. Syllabus Assignments. The MC will be required to fly the entire syllabus before being considered for the next stage.

3. Re-fly Intervals. Listed in the training unit's syllabus.

4. Combat Capable Syllabus Objectives. Listed below are the titles of the learning objective areas associated with the entry level training syllabus for Pioneer UAV Mission Commanders. This course of instruction is conducted by NAMTRAGRU DET AMTU 6001, Fort Huachuca, AZ. Detailed descriptions of each area available from NAMTRAGRU.

1) Basic Aerodynamics.
2) Basic Navigation.
3) FAA Regulation/Procedures.
4) Ground/Flight Safety and Mishap Procedures/Reporting.
5) Aircrew Coordination.
6) SOP and Course Rules.
7) JUAVTOPS Checklist Procedures.
8) JUAVTOPS and Aircrew Training Records.
9) Weather and Factors effecting UAV Operations.
10) Basic Mission Planning.
11) Technical/Maintenance Documentation.
12) Emergency Procedures.
13) Pioneer UAV.
14) Ground Control Station.
15) Tracking Communications Unit.
16) Remote Receive Station.
17) Portable Control Station.
18) Remote Receive Station.
19) System Limitations.
20) Day Payload.
21) Night Payload.
22) Briefing/Debriefing.
23) Modes of Launch/Recovery.
24) Flight Modes.
25) In-Flight Navigation.
26) Aircrew Training Documentation.
27) Fire Support.
28) Radio Communication Procedures.
29) Advanced Mission Planning.

342. COMBAT READY PHASE

1. Familiarization (FAM)

a. Purpose. To develop proficiency and experience as a Mission Commander in UAV system operations and to emphasize importance of crew coordination, system operation, emergency procedures, operational terminology and familiarization with local SOPs.

b. General

(1) Prior to completion of this stage of training the MC Under Instruction (MCUI) will successfully complete the local course rules exam and squadron Flight SOP exam.

(2) All MCUI receiving this training will have at a minimum an interim secret clearance.

(3) Upon successful completion of Combat Ready Training, MCUI shall be considered qualified to be designated as a squadron Mission Commander.

c. Ground Training. (3 Events, 4.0 Hours). Where required, ground (GND) syllabus events have been scheduled to augment the flight syllabus requirements. These events can be executed in conjunction with the flight events. However, the completion of the ground training event prior to its corresponding flight is mandatory. Ground events cannot update or replace the corresponding flight event.

d. Flight Training. (3 Flights, 4.0 Hours).

FAM-200 1.0 GND C,R CREW POSITION: MC

Goal. Introduce the MCUI to the area of operation, unit SOPs, local course rules and regulations.

Requirement. The MCUI will successfully complete the annual course rules exam and the squadron SOP exam.

Performance Standards. Pass an open/closed book written exam with a minimum score of 80%.

FAM-201 1.0 GND C,R RQ-2 CREW POSITION: MC

Goal. Introduce the MCUI to the unit's system, crew coordination and pre-flight/presets and post-flight procedures.

Requirement. Review/discuss all components of the unit's system, crew coordination, presets for the payload, plotter and internal operator bays, pre-flight of all system components individual crew position responsibilities, Rolling/RATO/Pneumatic launch procedures and post flight procedures.

Performance Standards. During a practical application, correctly perform IAW JUAVTOPS and local unit SOPs.

Prerequisite. FAM 200.

FAM-202 1.0 FLT C GCS CREW POSITION: MC

Goal. Introduce the MCUI to the local flight pattern.

Requirement. Introduce the MCUI to the local flight pattern to include launch and recovery procedures. Introduce coordination with local controlling agencies. Introduce emergency procedures.

Performance Standard. IAW JUAVTOPS and local unit SOPs.

Prerequisite. FAM-201.

FAM-203 1.0 FLT C,R GCS CREW POSITION: MC

Goal. The MCUI will conduct a local flight and be introduced to range flight operations.

Requirement. Review local flight procedures to include exit/entry procedures. Introduce dish lock procedures, range flight operations and coordination with range controlling agencies.

Performance Standard. IAW JUAVTOPS and local unit SOPs.

Prerequisite. FAM-202.

FAM-204 2.0 FLT C,R GCS CREW POSITION: MC

Goal. The MCUI will conduct range flight operations, and be introduced to downrange emergency procedures.

Requirement. The MCUI will conduct range flight operations. Downrange emergency procedures will be introduced through simulation.

Performance Standard. IAW JUAVTOPS and local unit SOPs.

Prerequisite. FAM-203.

FAM-205 2.0 GND C,R CREW POSITION: MC

Goal. Introduce mission planning, briefing, and debriefing.

Requirement. The MCUI will be introduced to mission planning, briefing, and debriefing. The MCUI will collect meteorological data, calculate fuel required, take off distance, routes, altitude requirements, airspeeds and coordinate with supported unit and controlling agencies.

Prerequisite. FAM-204.

2. Navigation (NAV)

a. Purpose. To develop proficiency and experience in UAV navigational procedures.

b. General. Combat Capable Training Qualification should be obtained prior to commencing this stage.

c. Flight Training. (2 Flights, 3.0 Hours).

NAV-210 1.5 FLT C GCS CREW POSITION: MC

Goal. Demonstrate/Introduce the MCUI to UAV navigation.

Requirement. Demonstrate/Introduce the MCUI to navigational procedures using the plotter, radial maps, terrain association, payload graphics, radar or ATC assistance and plotter failure procedures.

Performance Standards. During the knob control mode of flight:

(1) Using the plotter, coordinate navigation to two points.

(2) Using radial maps, coordinate navigation to two points.

(3) During plotter failure, coordinate effective crew coordination to navigate.

Prerequisite. FAM-205.

NAV-211 1.5 FLT C,R GCS CREW POSITION: MC

Goal. Conduct UAV navigation.

Requirement. Using mission planning information developed in FAM-205, the MCUI will plan, brief, execute, and debrief a range navigation flight.

Performance Standard. The MCUI will execute the plan within given parameters to successfully navigate to a minimum of four points. Conduct effective coordination with controlling agencies and UAV crew.

Prerequisite. NAV-210.

3. Night Operations (NITE)

a. Purpose. To develop proficiency and experience in UAV night operations.

b. General. Combat Capable Training should be obtained prior to commencing this stage. Prior to beginning the NITE events, the FAM and NAV 200 stages must be completed.

c. Ground Training. (1 Event, 1.0 Hour). This event can be executed in conjunction with the flight event. However, the completion of the ground training event prior to its corresponding flight is mandatory.

d. Flight Training. (1 Flight, 1.0 Hour).

NITE-220 1.0 GND C CREW POSITION: MC

Goal. Introduce the MCUI to UAV night operations.

Requirement. The MCUI will be introduced to safety procedures, lighting requirements of the runway UAV aircraft lighting, and the launch/recovery site. Review and discuss specific emergencies effected by night operation, night procedures, night crew coordination procedures, MKD-400/400C characteristics, and local SOPs and regulations for night operations.

NITE-221 1.0 FLT C,R GCS N CREW POSITION: MC

Goal. Conduct UAV night operations.

Requirement. Conduct planning, briefing, execution, and debriefing of both a local and range flight.

Performance Standard. The MCUI will observe a minimum of two low approaches, dish lock procedures, and entry/exit procedures. The MCUI will conduct effective crew coordination and coordination with local and range controlling agencies.

Prerequisites. NITE-220.

4. Mission Commander Qualification (MCQM)

a. Purpose. To certify the MCUI as a Mission Commander Qualified in Model.

b. General. Combat Ready Phase complete prior to this stage.

c. Ground Training. Complete open/closed book JUAVTOPS exam.

d. Flight Training. (1 Flight, 2.0 Hours).

MCQM-230 2.0 FLT C,R E GCS (N) CREW POSITION: MC

Goal. Combat Ready check for the MC position.

Requirement. Plan, brief, execute, and debrief a local and a range flight coordinating local and range flight procedures, navigation and emergency procedures.

Performance Standard. The MCUI must successfully complete a launch and recovery, five simulated emergencies and coordinate navigation to four specific points.

343. COMBAT QUALIFICATION PHASE

1. Threat Recognition (TREC)

a. Purpose. To develop proficiency and experience in threat recognition.

b. General. The Combat Ready Phase of training should be completed prior to commencing Combat Qualification Training.

c. Ground Training. (2 Events, 2.0 Hours).

TREC-300 1.0 GND C CREW POSITION: MC

Goal. Perform threat weapon and vehicle recognition.

Requirement. The MCUI will attend a threat weapon/vehicle recognition class given by the intelligence section. The class will include friendly as well as enemy weapon/vehicle recognition.

Performance Standards. Upon completion of this event, the MCUI will pass an exam with a minimum score of 80%.

TREC-301 1.0 GND C CREW POSITION: MC

Goal. Evaluate threat SAM/AAA recognition.

Requirement. The MCUI will attend a SAM/AAA recognition class given by the intelligence section. The class will include friendly as well as enemy SAM/AAA recognition.

Performance Standards. Upon completion of this event, the MCUI will pass an exam with a minimum score of 80%.

2. Mission Planning (MP)

a. Purpose. To develop proficiency and experience in tactical UAV mission planning.

b. General. Combat Ready qualification should be obtained prior to commencing Combat Qualification Training.

c. Ground Training. (1 Event, 3.0 Hours). This event can be executed in conjunction with the flight events, however the completion of the ground training event prior to the flight events is required. The ground training cannot replace or update the corresponding flight events.

d. Flight Training. (2 Flights, 4.0 Hours).

MP-310 2.0 FLT C GCS (N) CREW POSITION: MC

Goal. Conduct preflight tactical mission planning, briefing, execution, and debriefing.

Requirement. Given a threat scenario, the MCUI will conduct all preflight planning and prepare the tactical mission brief, conduct the mission, and debrief the mission. Airborne mission changes will be introduced.

Performance Standards. IAW JUAVTOPS, conduct the brief, mission, and debrief. During the mission, coordinate navigation to a minimum of four specific targets/areas and report the required items/events pertaining to the mission.

Prerequisites. FAM-205, TREC-300 and TREC-301.

MP-311 3.0 GND C,R CREW POSITION: MC

Goal. Conduct advanced tactical mission planning.

Requirement. Introduce selection of UAV deployment site for single and split site operations. Determine mission requirements from JTAR/S, ACOs and ATOs. Determine coordination, communication, and planning requirements needed to effectively integrate with other aircraft and supporting arms.

Performance Standard. IAW JAUVTOPS, and considering the following parameters: communications, intelligence, fire support coordination, aviation schemes of maneuver, ground schemes of maneuver, airspace control measures, aviation tasking, command and control, and joint/combined forces determine planning and execution requirements for UAV operations.

Prerequisite. MP-310.

MP-312 2.0 FLT C,R GCS (N) CREW POSITION: MC

Goal. Conduct advanced tactical mission planning, briefing, execution, and debriefing.

Requirement. Given a threat scenario, the MCUI will conduct and prepare the tactical mission brief, conduct the mission, and debrief the mission. The MCUI will use the plan developed in MP 311. During the flight the MCUI will be required to conduct in-flight planning in order to react to a change in primary mission.

Performance Standards. IAW JUAVTOPS, conduct the brief, mission, and debrief. During the mission, supervise navigation to a minimum of four specific targets/areas and report the required items/events pertaining to the mission. Maintain effective crew coordination and situational awareness while reacting to in flight changes to the briefed mission.

Prerequisites. FAM-205, TREC-300 and TREC-301.

3. Supporting Arms Control (SAC)

a. Purpose. To develop proficiency and experience in UAV observation of fires and control of indirect fires.

b. Ground Training. (1 Event, 3.5 Hours). This event must be completed prior to the flight event.

c. Simulator Training. (1 Event, 1.0 Hour). For this portion of training the MCUI may use the TSFO Facility or CAS Trainer Facility to simulate the control of supporting arms. As much realism as possible is encouraged. This event cannot update any flight events.

e. Flight Training. (1 Flight, 2.0 Hours)

SAC-320 3.5 GND C,R CREW POSITION: MC

Goal. Introduce the MCUI to observation of fires, fire support coordination and supporting arms control.

Requirement. The MCUI will receive instruction on observation of fires, fire support coordination, the call for fire for artillery/mortar and naval surface fires, supporting arms adjustment using the light pen and other methods. The MCUI will also receive instruction on communication requirements to fire support units, and in artillery, mortars and naval surface fires weapon systems.

SAC-321 1.0 SIM/FLT C,R GCS (N) CREW POSITION: MC

Goal. Conduct call for fire and adjustment of indirect fire.

Requirement. Using the TSFO Trainer Facility, CAS Trainer Facility, or actual flight, the MCUI will conduct simulated or live call for fire missions, and adjustment of indirect fire.

Performance Standards. The operator must correctly call for and adjust a minimum of three (simulator) or one (live) artillery/mortar/naval surface fires mission(s).

Prerequisite. SAC-320.

Ordnance. (8) 155mm HE, (5) 155mm WP or equivalent NSF ammunition.

External Syllabus Support. (1) 155mm Battery, (1) 81mm mortar section, (1) NSF support ship.

SAC-322 2.0 FLT C,R GCS (N) CREW POSITION: MC

Goal. Conduct call for fire and adjustment of indirect fire.

Requirement. The MCUI will successfully call for and adjust indirect fire on a specific target.

Performance Standards. The operator will complete a minimum of one artillery/mortar/naval surface fire mission. The MCUI will also report BDA upon completion of firing.

Prerequisite. SAC-321.

Ordnance. (8) 155mm HE, (5) 155mm WP or equivalent mortar/NSF ammunition.

External Syllabus Support. (1) 155mm Battery, (1) 81 mortar section, (1) NSF support ship.

4. Split Site Operations (SSO)

a. Purpose. To introduce, develop proficiency and experience in UAV split site operations.

b. General. The MCUI must complete the Combat Ready Qualification Training prior to executing these events.

c. Ground Training. (1 Event, 1.0 Hour). This event may be executed in conjunction with the corresponding flight event. However, the completion of this event is mandatory prior to executing the flight event.

d. Flights Training. (1 Flight, 1.0 Hour). This event may be simulated from a consolidated site vice an actual split site.

SSO-330 1.0 GND C,R CREW POSITION: MC

Goal. Introduce split site operations.

Requirements. The MCUI will be introduced to UAV split site operations and procedures. Discuss emergency procedures, return home procedures, mission planning requirements, GCS/PCS operations, communication/no-communication procedures, presets/pre-flight checks and control transfer. Discuss the differences in payload operation, navigation, as they differ from the GCS and PCS.

SSO-331 1.0 FLT C,R RQ-2 (N) CREW POSITIONS: MC

Goal. Conduct split site operations.

Requirements. The MCUI will conduct UAV split site operations. Conduct simulated emergency procedures, simulated return home procedures, mission planning requirements, GCS/PCS operations, communication/no-communication procedures, presets/pre-flight checks and control transfer.

Performance Standard. IAW JUAVTOPS and unit SOP.

Prerequisite. SSO-330.

344. FULL-COMBAT QUALIFICATION PHASE

1. Dual UAV Operations (OPS)

a. Purpose. To introduce and develop proficiency and experience in dual UAV operations. Dual UAV operations is defined as having two UAVs airborne at once and conducting a relief on station in order to increase mission time and time on station.

b. General. The MCUI must complete the Combat Qualification syllabus and split site operations.

c. Ground Training. (1 Event, 1.0 hour).

d. Flight Training. (1 Flight, 1.0 hour).

OPS-400 1.0 GND C,R CREW POSITION: MC

Goal. Introduce dual UAV operations.

Requirement. The MCUI will be introduced to dual UAV operations. Discuss procedures for transferring control of UAVs, dual UAV operation, checklists, frequency requirements, specific emergency procedures, use of navigation programmer, and crew coordination.

OPS-401 1.0 FLT C,R RQ-2 (N) CREW POSITION: MC

Goal. Conduct dual UAV flight operations.

Requirement. The MCUI will conduct dual UAV flight operations.

Performance Standard. IAW JUAVTOPS and unit SOP.

Prerequisite. OPS-400.

350. INSTRUCTOR UNDER TRAINING

1. Purpose. To develop proficiency and experience as a Mission Commander Instructor. Upon completion the MC will be considered a qualified UAV Mission Commander Instructor.

2. General. Full Combat Qualification Training must be obtained prior to commencing Instructor training.

3. Ground Training. (4 Events, 7.5 Hours). This training must be completed prior to being designated as an instructor.

4. Simulator Training. (1 Event, 1.0 Hour). Simulator training may be completed using the TSFO Trainer or CAS Facilities for SAC training.

5. Flights Training. (5 Flights, 9.5 Hours).

IUT-500 1.0 GND E CREW POSITION: IUT

Goal. Introduce IUT to the principles of instruction and standardization/training tools.

Requirements. Discuss references for training such as JUAVTOPS, T&R Manual, Range SOPs and Unit SOPs. The IUT will receive a period of instruction on instructional techniques and instructor duties. This instruction will cover all administrative duties, JUAVTOPS requirements, aircrew training and readiness record keeping, and evaluation documentation.

Performance Standards. Upon completion of this event the IUT must pass a UAV Systems exam with a score of 80% before proceeding.

IUT-501 1.0 GND E CREW POSITION: IUT

Goal. Conduct FAM-201 instruction.

Requirement. The IUT will conduct a Mission Commander FAM-201 class.

Prerequisite. IUT-500.

IUT-502 2.0 FLT E RQ-2 (N) CREW POSITION: IUT

Goal. Conduct instruction during a Mission Commander FAM Flight event.

Requirement. The IUT must demonstrate the ability to instruct an MC during a FAM flight. Be able to evaluate performance and correct deficiencies.

Performance Standards. Identify and evaluate performance and correct deficiencies in a timely manner.

Prerequisite. IUT 501.

IUT-503 3.5 FLT E GCS (N) CREW POSITION: IUT

Goal. Conduct instruction during a NAV flight.

Requirement. The IUT must demonstrate the ability to instruct a Mission Commander during NAV-211.

Performance Standards. Be able to evaluate performance and correct deficiencies. Demonstrate navigation with and without plotter, payload graphics, radial maps and system information.

Prerequisite. IUT-502.

IUT-504 2.0 GND E CREW POSITION: IUT

Goal. Conduct MP-311.

Requirement. The IUT will conduct an MP-311 training class.

Performance Standards. Be able to evaluate performance and identify deficiencies in task organization and mission planning in a tactical scenario.

Prerequisite. IUT-503.

IUT-505 3.0 FLT E GCS (N) CREW POSITION: IUT

Goal. Conduct MP-312.

Requirement. The IUT will conduct a TMP-312 training flight.

Performance Standards. Be able to evaluate performance and identify deficiencies during execution of a tactical flight.

Prerequisite. IUT-504.

IUT-506 3.5 GND E CREW POSITION: IUT

Goal. Conduct SAC-320 instruction.

Requirement. The IUT will conduct a SAC-320 training class.

Performance Standards. Be able to evaluate performance and identify deficiencies in observation of fires, fire support coordination, and supporting arms control.

Prerequisite. IUT-505.

IUT-507 1.0 SIM/FLT E CREW POSITION: IUT

Goal. Conduct SAC-321 or SAC-322 training.

Requirement. The IUT will conduct a SAC-321 using the TSFO or CAS Facility. This may be accomplished by a SAC-322 flight but is not required.

Performance Standards. Be able to evaluate performance and identify deficiencies in observation of fires, fire support coordination, and supporting arms control.

Prerequisite. IUT-506.

Ordnance. (8) 155mm HE, (5) 155mm WP or equivalent NSF ammunition.

External Syllabus Support. (1) 155mm Battery, (1) 81mm mortar section, (1) NSF support ship.

IUT-508 1.0 FLT E RQ-2 (N) CREW POSITION: IUT

Goal. Qualification as a Mission Commander Instructor.

Requirement. The IUT will conduct instruction on a MCQM-230 or MP-312.

Performance Standard. Be able to evaluate performance and identify deficiencies as outlined in the performance standards of an MCQM-230 or MP-312.

Prerequisite. Current IUT-500 exam and completion of IUT 500-507 events.

351. REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS (RQD)

1. JUAVTOPS Evaluation

a. Purpose. To ensure standards, procedures and requirements of the JUAVTOPS Manual are complied with.

b. General

(1) Written examinations must be completed prior to flight event and current within 30 days.

(2) The JUAVTOPS Manual will be used as the reference for these events.

c. Ground Training. Per the JUAVTOPS Manual.

d. Flight Training. (2 Flights, 4.0 Hours). This flight can not be simulated.

RQD-600 2.0 FLT E GCS (N) CREW POSITION: MC

Goal. Annual JUAVTOPS qualification.

Requirements. Display knowledge and demonstrate compliance with the JUAVTOPS Manual. Specific launch/recovery type is not required.

Performance Standards. IAW JUAVTOPS. Successfully pass open book, closed book and oral exams.

Prerequisite. Combat Capable complete.

RQD-601 2.0 FLT E RQ-2 (N) CREW POSITION: JUAVTOPS EVALUATOR

Goal. Designation as a JUAVTOPS MC Evaluator.

Requirements. The MC will be required to evaluate a CK-600 flight in accordance with the JUAVTOPS Manual.

Performance Standards. IAW JUAVTOPS.

Prerequisite. Current CK-600 and designated as an MCI.

360. ORDNANCE REQUIREMENTS. Annual ordnance requirements are developed on a "per crew" basis per OPNAVNOTE 8010.

1. External Ordnance - BASIC/REF/CONV

ORDANANCE	100 SERIES	200 SERIES	300 SERIES	400 SERIES	REFRESHER	IUT	ANNUAL*
155mm HE (1)	0	0	16	0	16	8	16
155mm WP (1)	0	0	10	0	10	5	10
Note 1: A like amount of 81mm mortars may be substituted for the 155 mm ammunition							

*Annual Ordnance requirements maintain an aircrew member at proficiency.

AIRCRAFT: UAV MOS: 7315 CREW POSITION: MISSION COMMANDER

STAGE	EVENT CODE		HRS	REFLY INTERVAL	CRP	C	R	E	REMARKS	CREW POSITION
COMBAT READY PHASE										
FAM	200	GND	1.0	12	1.0	X	X			MC
	201	GND	1.0	12	1.0	X	X		RQ-2	MC
	202	FLT	1.0	12	1.0	X			GCS	MC
	203	FLT	1.0	12	1.0	X	X		GCS	MC
	204	FLT	2.0	12	1.5	X	X		GCS	MC
	205	GND	2.0	12	1.5	X	X			MC
NAV	210	FLT	1.5	12	1.5	X			GCS	MC
	211	FLT	1.5	12	1.5	X	X		GCS	MC
NITE	220	GND	1.0	12	1.5	X				MC
	221	FLT	1.0	12	1.5	X	X		GCS (N)	MC
MCQM	230	FLT	2.0	*	2.0	X	X	X	GCS (N)	MC
COMBAT QUALIFICATION PHASE										
TREC	300	GND	1.0	*	2.0	X				MC
	301	GND	1.0	*	2.0	X				MC
MP	310	FLT	2.0	12	2.0	X			GCS (N)	MC
	311	GND	3.0	12	2.0	X	X			MC
	312	FLT	2.0	12	2.0	X	X		GCS (N)	MC
SAC	320	GND	3.5	6	2.0	X	X			MC
	321	SIM/FLT	1.0	6	2.0	X	X		GCS (N)	MC
	322	FLT	2.0	12	2.0	X	X		GCS (N)	MC
SS0	330	GND	1.0	6	2.0	X	X			MC
	331	FLT	1.0	12	2.0	X	X		RQ-2 (N)	MC
FULL-COMBAT QUALIFICATION PHASE										
OPS	400	GND	1.0	12	2.5	X	X			MC
	401	FLT	1.0	12	2.5	X	X		RQ-2 (N)	MC
INSTRUCTOR UNDER TRAINING										
IUT	500	GND	1.0	*				X		IUT
	501	GND	1.0	*				X		IUT
	502	FLT	2.0	*				X	RQ-2 (N)	IUT
	503	FLT	3.5	*				X	GCS (N)	IUT
	504	GND	2.0	*				X		IUT
	505	FLT	3.0	*				X	GCS (N)	IUT
	506	GND	3.5	*				X		IUT
	507	SIM/FLT	1.0	*				X		IUT
	508	FLT	1.0	*				X	RQ-2 (N)	IUT

Figure 3-2.--MOS 7315 Refly Interval, Combat Readiness Percentage

AIRCRAFT: UAV MOS: 7315 CREW POSITION: MISSION COMMANDER

STAGE	EVENT CODE		HRS	REFLY INTERVAL	CRP	C	R	E	REMARKS	CREW POSITION
REQUIREMENTS, QUALIFICATIONS, DESIGNATIONS										
RQD	600	FLT	2.0	12				X	GCS (N)	MC
	601	FLT	2.0	12				X	RQ-2 (N)	MC

Figure 3-2.--MOS 7315 Refly Interval, Combat Readiness Percentage

UAV MISSION COMMANDER FLIGHT UPDATE CHAINING

STAGE	FLIGHT	FLIGHTS UPDATED
FAM	200	
	201	200
	202	200,201
	203	200,201,202
	204	200,201,202,203
	205	
NAV	210	200,201,202,203,204,205
	211	200,201,202,203,204,205,210
NITE	220	
	221	200,201,202,203,204,205,210,211,220
MCQM	230	200,201,202,203,204,205,210,211
TREC	300	
	301	
MP	310	205,210,211
	311	
	312	205,210,211,310,211
SAC	320	
	321	320
	322	320,321
SSO	330	
	331	201,202,203,204,205,210,211
OPS	400	
	401	201,202,203,204,205,210,211,330,331

Figure 3-3.--Flight Update Chaining

APPENDIX A

MARINE UNMANNED AERIAL VEHICLE SQUADRON - VMU

CORE COMPETENCY

1. **MISSION.** The mission of UAV squadron is to conduct reconnaissance, surveillance, target acquisition, indirect fire adjustment, battlefield damage assessment, and support the rear area security plan during expeditionary operations or joint and combined operations.

2. **MISSION ESSENTIAL TASK LIST**

A. CONDUCT AIR RECONNAISSANCE.

B. CONDUCT OBSERVATION OF FIRES AND INDIRECT FIRE ADJUSTMENT.

C. CONDUCT BATTLEFIELD DAMAGE ASSESSMENT.

D. CONDUCT REAR AREA SECURITY SURVEILLANCE.

E. MAINTAIN CAPABILITY TO PROCESS AND PASS INFORMATION BY VOICE.

F. MAINTAIN CAPABILITY TO RECEIVE RAW IMAGERY THROUGH REMOTE RECEIVE STATIONS.

G. MAINTAIN CAPABILITY TO OPERATE DURING DAY AND NIGHT IN VMC.

H. MAINTAIN CAPABILITY TO CONDUCT ALL MODES OF LAUNCH, CONTROL AND RECOVERY.

I. MAINTAIN ABILITY TO OPERATE FROM AIRFIELDS AND FORWARD OPERATING BASES.

J. MAINTAIN ORGANIC GROUND TRANSPORTATION OF EQUIPMENT.

K. MAINTAIN ORGANIC SINGLE CHANNEL COMMUNICATIONS AND SUPPORT.

3. **SQUADRON CORE CAPABILITY**

a. A core capable squadron is able to sustain the following minimum performance on a daily basis during sustained contingency/combat operations, assuming at least 100% PAA, 90% in reporting status and 90% T/O on hand in all MOS's. If < 90%, core capability will be degraded by a like percentage. The extent to which a core capable squadron is able to surge beyond its core capability is situational dependent.

b. A core capable squadron is able to conduct 3 single plane 4.0 hour sorties in a 24 hour period. Perform the above from a main air base or appropriate sized expeditionary runway.

4. **INTERNAL OPERATOR CORE SKILLS.** Core skills are depicted in the following matrix and directly support the METL. Core skills shall be a determining factor in developing T&R training requirements. Core Plus skills and training requirements must receive appropriate prioritization and emphasis in respective T&R manuals.

	CORE SKILLS								CORE PLUS SKILLS	
MET	FAM	NAV	TREC	MISSION PLANNING	SAC	PCS	SSO	ADV MSN PLANNING	DUAL OPERATIONS
A	X	X	X	X				X	
B	X	X	X	X	X			X	
C	X	X	X	X	X				
D	X	X	X	X				X	
E				X				X	
F				X				X	
G	X	X		X		X	X	X	X
H	X	X		X		X	X	X	X
I	X	X		X		X	X	X	X

5. **EXTERNAL OPERATOR CORE SKILLS.** Core skills are depicted in the following matrix and directly support the METL. Core skills shall be a determining factor in developing T&R training requirements. Core Plus skills and training requirements must receive appropriate prioritization and emphasis in respective T&R manuals.

CORE SKILLS				
MET	FAM	RATO	PL	SLF
A	X			
B	X			
C	X			
D	X			
E				
F				
G	X	X	X	X
H	X	X	X	X
I	X	X	X	X

6. **MISSION COMMANDER CORE SKILLS.** Core skills are depicted in the following matrix and directly support the METL. Core skills shall be a determining factor in developing T&R training requirements. Core Plus skills and training requirements must receive appropriate prioritization and emphasis in respective T&R manuals.

	CORE SKILLS							CORE PLUS SKILLS
MET	FAM	NAV	NITE	MP	TREC	SAC	SSO	OPS
A	X	X	X	X	X			X
B	X	X	X	X	X	X		X
C	X	X	X	X	X	X		X
D	X	X	X	X	X			X
E	X			X	X	X		
F	X	X	X	X				
G	X	X	X	X				X
H	X	X	X	X			X	X
I	X	X	X	X			X	X

APPENDIX B

MARINE UNMANNED AERIAL VEHICLE SQUADRON - UAV

UNIT TEMPLATE

1. **TABLE OF ORGANIZATION**

33 = INTERNAL OPERATORS
5 = EXTERNAL OPERATORS
5 = MISSION COMMANDERS

2. **SQUADRON CORE CAPABILITY**

a. A core capable squadron is able to sustain the following minimum performance on a daily basis during sustained contingency/combat operations, assuming at least 100% PAA, 90% in reporting status and 90% T/O on hand in all MOS's. If < 90%, core capability will be degraded by a like percentage. The extent to which a core capable squadron is able to surge beyond its core capability is situationally dependent.

b. A core capable squadron is able to conduct 3 single plane 4.0 hour sorties in a 24 hour period. Perform the above from a main air base or appropriate sized expeditionary runway.

3. **BASIC OPERATOR QUALIFICATIONS**. As a minimum, in order to be considered Core Competent, a squadron must possess the following numbers of operators who are at least 75% complete in each listed core skill. (Note: If a squadron is < T/O, required numbers are reduced by a like %)

INTERNAL OPERATOR	
CORE SKILLS	SQUADRON
FAM	7
NAV	7
TREC	3
MP	4
SAC	2
PCS	2
SSO	6

EXTERNAL OPERATOR	
CORE SKILL	SQUADRON
FAM	2
RATO	2
PL	2
SFL	2

MISSION COMMANDER	
CORE SKILL	SQUADRON
FAM	2
NAV	2
NITE	2
MP	2
TREC	2
SAC	2
SSO	4

4. **REQUIRED CORE SKILLS AND SORTIES**

INTERNAL OPERATOR	FAM	NAV	TREC	MP	SAC	PCS	SSO	TOTAL
1ST TOUR	8	7	2	3	3	3	3	29
2ND TOUR	4	4	2	2	2	3	3	20
T&R CODES *2ND TOUR	200* 201* 202 203 204 205 206* 207*	210* 211 212* 213 214* 220 221*	300* 301*	310* 311 312*	320* 321 322*	330* 331* 332*	340* 341* 342*	

EXTERNAL OPERATOR	FAM	RATO	PL	SFL	TOTAL			
1ST TOUR	8	2	2	2	14			
2ND TOUR	8	2	2	2	14			
T&R CODES *2ND TOUR	200* 201* 202* 203* 204* 205* 206* 207*	300* 301*	310* 311*	320* 321*				

MISSION COMMANDER	FAM	NAV	NITE	TREC	MP	SAC	SSO	TOTAL
1ST TOUR	6	2	2	2	3	3	2	20
2ND TOUR	5	1	1	0	2	3	2	14
T&R CODES *2ND TOUR	200* 201* 202 203* 204* 205*	210 211*	220 221*	300 301	310 311* 312*	320* 321* 322*	330* 331*	

5. **SORTIES REQUIRED TO MAINTAIN CORE SKILLS**. For each twelve month period after achieving competency, a pilot would be required to fly the following number of sorties in each skill area to maintain that competency.

INTERNAL OPERATOR	FAM	NAV	TREC	MP	SAC	PCS	SSO	TOTAL
	4	4	2	4	1	1	2	18

EXTERNAL OPERATOR	FAM	RATO	PL	SFL	TOTAL
	3	1	1	1	6

MISSION COMMANDER	FAM	NAV	NITE	TREC	MP	SAC	SSO	TOTAL
	2	1	1	2	1	2	2	11

6. **INSTRUCTOR QUALIFICATIONS**. As a minimum, in order for a squadron to be considered Core Competent, it must possess the following numbers of aircrew in the listed instructor categories. (Note: If the squadron is < T/O, required numbers are reduced by a like %)

DESIGNATION	SQUADRON	REMARKS/ EXAMPLES
WTI	0	
IOI	3	
EOI	2	
MCI	2	
SACI	2	
JUAVTOPSI	2	

7. **SORTIES REQUIRED TO QUALIFY FOR DESIGNATION AS AN INSTRUCTOR**

WTI	IOI	EOI	MCI	SACI	JUAVTOPSI
See MAWTIS-1 Course	7 500-506	7 500-506	9 500-508	2 510,511	1 601